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Illinois U Library

The IRON AGE

OCTOBER 7, 1948

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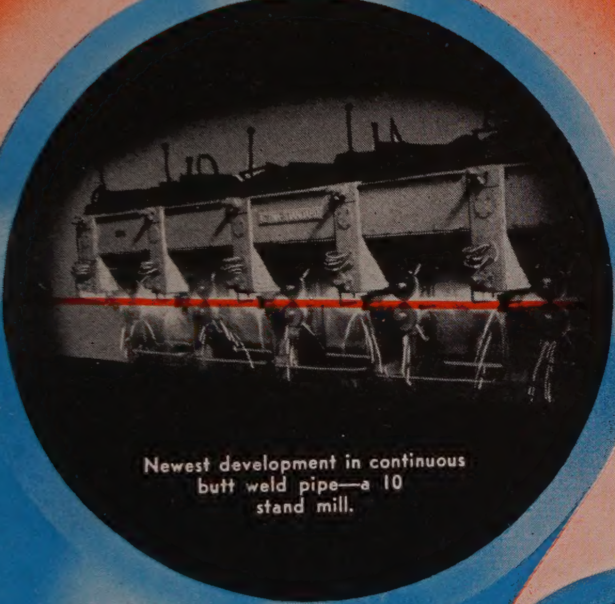

Newest development in continuous butt weld pipe—a 10 stand mill.

AETNA-STANDARD leads the world in engineering, designing and building of seamless tube mills and continuous butt weld pipe mills. They build more pipe and tube mills than all other companies combined.

Aetna-Standard is now completing the two fastest seamless tube mills in the world.

DESIGNERS AND BUILDERS to the Steel, Non-Ferrous and Chemical Industries

HE AETNA-STANDARD ENGINEERING COMPANY · YOUNGSTOWN, OHIO

ASSOCIATED COMPANIES:
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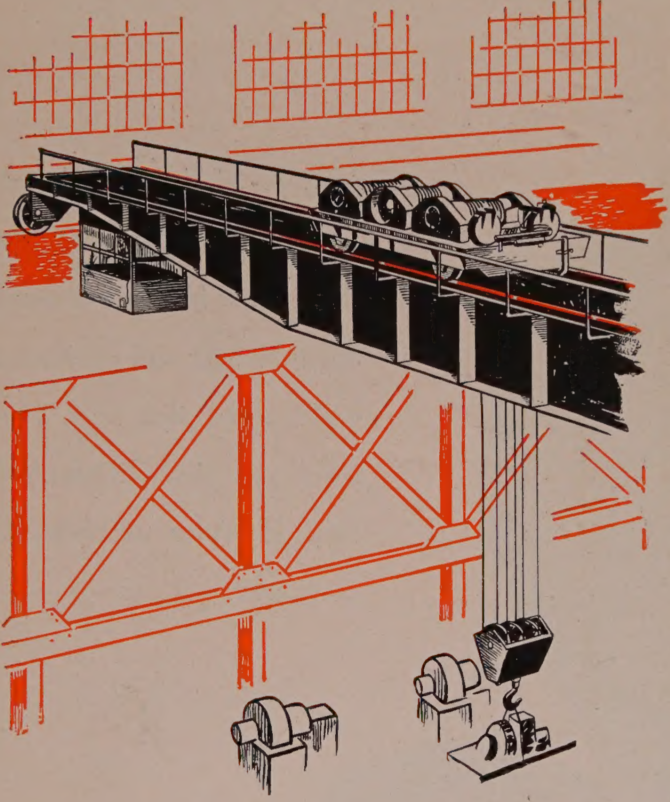
AETNA-STANDARD ENGINEERING COMPANY, LTD., TORONTO, ONTARIO, CANADA

FOR 18 YEARS

never a bearing failure with Farval



FARVAL—*Studies in Centralized Lubrication*
No. 106

EIGHTEEN years ago, Farval Centralized Lubrication was installed on a 10-ton overhead traveling crane in one of the steel mills in the Chicago district. A recent report on this early job states that the Farval systems are still in service, as good as on the day they were installed, and that since 1930 the crane has never been down for a bearing repair or replacement. In short, there has never been a minute's trouble due to faulty lubrication.

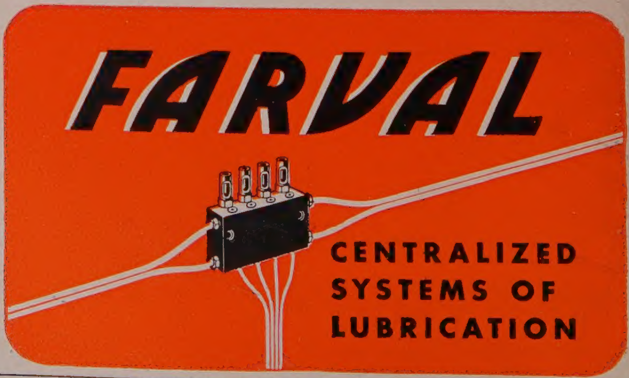
Two manually-operated Farval systems—one on the bridge and one on the trolley—serve 56 points of lubrication including the wheel bearings. In less than five minutes, every eight hours, the operator lubricates every bearing on the crane from two conveniently located hand pumps. No need to climb all over the crane and never a bearing is skipped. Grease consumption is greatly reduced because there is no waste, and drippage is practically eliminated.

More than 2000 Farval systems have been installed on cranes. Many of them are roller bearing cranes, where clean grease is essential and over-lubrication should be avoided.

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. It does its work while the equipment is in operation. Farval—the Dualine System with the Positive Piston Displacement Valve—that has but 2 Moving Parts—is Fully Adjustable—and with a Tell-tale indicator at each bearing to show the job is done.

Write for Bulletin 25 for a full description of Farval. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



THE IRON AGE, published every Thursday by the *CHILTON CO. (INC.)*, Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Foreign Countries $20 per year. Single Copies 35c. Annual Review Number, $2.00. Vol. 162, No. 15.

friendly rivalry keeps us *keen....*

We of the Barium corporate neighborhood compete with each other in a friendly sort of way to produce the best products and provide the best possible service to our customers, but we work together *as one team* whenever our skills and facilities are needed to do a complete job.

The Barium group has the most modern facilities, strategically located, to produce a wide range of steel products, from raw material to finished fabrication. Consult Barium, addressing any subsidiary in the field of your interest.

WE MELT, ROLL, CAST, FORGE, STAMP, MACHINE AND FABRICATE STEEL

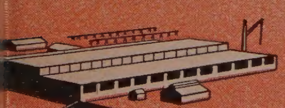
ONE OF THE 16 BARIUM GOOD NEIGHBORS

HEFFIELD IRON AND STEEL COMPANY

Subsidiary of Barium Steel Corporation

SHEFFIELD, ALABAMA

Producers of gray iron castings weighing up to five tons and King Ferronite Lighting Standards. Completely self-contained plant includes pattern shop, core room, and machine shop, with a capacity of 600 tons of commercial castings per month.



Barium STEEL CORPORATION

STEELWRIGHT TO THE NATION

EXECUTIVE OFFICES
25 BROAD ST., NEW YORK, N. Y.

BARIUM STEEL CORPORATION

42407

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PRODUCTS
SEND YOUR PRINTS TO
U.S.
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especially if your
plant is located
within this circle

AMHERST
OHIO

because we can
serve you better
with . . . .

- OVER 100 SCREW MACHINES
- SPECIAL MACHINERY
- TURRET AND ENGINE LATHES
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- HEAT TREATING
- ENGINEERING DEVELOPMENT AND ASSISTANCE
- BAR CAPACITY $\frac{3}{64}$" TO 5 $\frac{1}{2}$"

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NEW YORK
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Write for brochure
"Screw Machine Parts in Action"
U·S·Automatic Corp.
Amherst, Ohio

Fatigue Cracks

BY C. T. POST

Hangover Heaven

• • All of the fuss over the asserted tremendous benefit to mankind of using oxygen in the blast furnace, the open hearth, the electric furnace, the cupola and the bessemer is regrettable. One of our agents reports a development in the use of oxygen that will do far more for industrial productivity than all of these melting pots put together.

The oxygen companies have no right to keep it secret any longer that many of their favored customers have secured small cylinders of oxygen for home installation along with suitable masks for inhaling the stuff. The morning after entertaining visiting firemen, a heavy evening at Grogan's Cozy Corner, or even a solitary session with a bottle of Old Cobweb, they take a few quick whiffs. The clouds disappear, that dull throbbing sensation is gone, and the mind and reflexes are razor sharp once again.

We understand that Detroit, with its usual enterprise, has taken steps to make this development available to the garden variety executive. Announcements went out, we are told, inviting recipients to take advantage of the facilities of an oxygen parlor. Take your whiffs while relaxing in an overstuffed chair, with quiet surroundings, soft music and a masseur in attendance nearby if you like. If we'd managed to get the name and address, we'd let you in on it. This type of business would seem to have a rosy future. Comes the day when you find them on every other corner, like the coin laundries, the nation's productivity will zoom of a Monday morning.

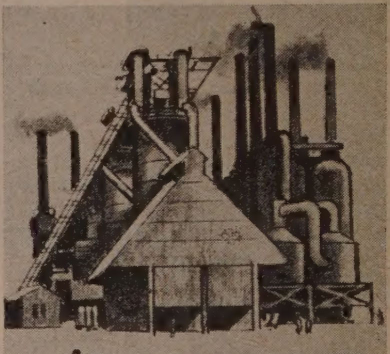
Son of Erin

• • Charles O. Herb is editor of *Machinery* magazine, though his name suggests a bent for botany or a talent for making salads. If names arouse color association in your mind, you'll have to agree that Herb flashes green. Green is for Ireland. Good Irishmen usually are named O'Brien, O'Grady, O'Connell, or O'Something. Therefore Charles O. Herb should be Charles O'Herb.

This reasoning has been actively promoted by Tom Lippert, dean of higher thought in the brains department of your favorite family journal, who addresses his fellow editor as "Mr. O'Herb." Lippert's campaign showed first signs of germinating the other day when Charles O. H. received an envelope addressed to Charles O'Herb. It was from New York State's Elmira Reformatory. Shows how far your f.f.j.'s influence reaches.

All Is Not Steel

• • Our friend the blast furnace superintendent is very much put out. His shirt and shoes off, and his feet propped on the hassock, he was relaxing over a Sunday supplement pictorial quiz entitled, "Industrial Buildings—Can You Name Them?" He identified six out of the seven pictures correctly, but missed on this one. He said it was a blast furnace plant. The official answers said it was a steel mill.



2 Here Uncle Sam tops the world

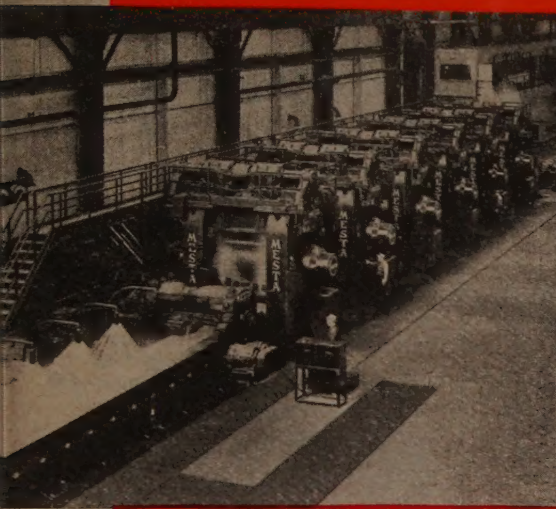
The picture obviously shows at least one blast furnace, a cast house, several stoves—probably more than necessary. Nowhere is there anything to indicate a steel mill. Probably it's a merchant furnace.

Until this thing came up we'd been very much worried about the effect of the comics on the adolescent generation. Now we figure that the threat of the pictorial section to the purity of thought of the adult mind is far more serious. The case is being reported to the S.S.S.S.—Society for the Suppression of Sunday Supplements.

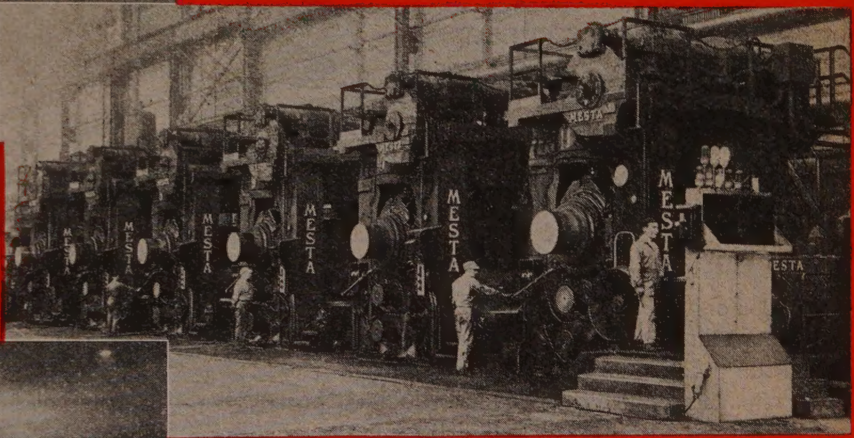
Publisher's Problem

• • Your favorite family journal has no problems, no problems at all, compared to the intellectual and arty Art Digest. The August issue carries a protesting letter from an artist of the modern school who complains that a photograph of his masterpiece, an abstraction of the most advanced sort, was printed upside down in a previous issue. The editors apparently had felt that the readers should view it while standing on their heads.

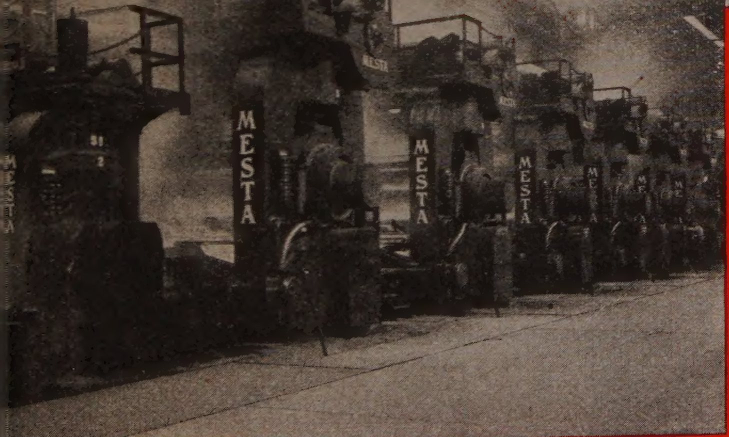
Hot Strip Mills
Designed and Built by
MESTA



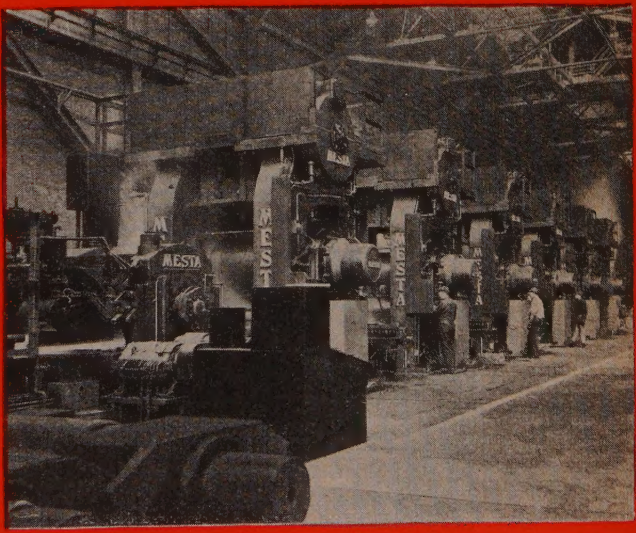
Mesta 80" Four-High Continuous Hot Strip Mill



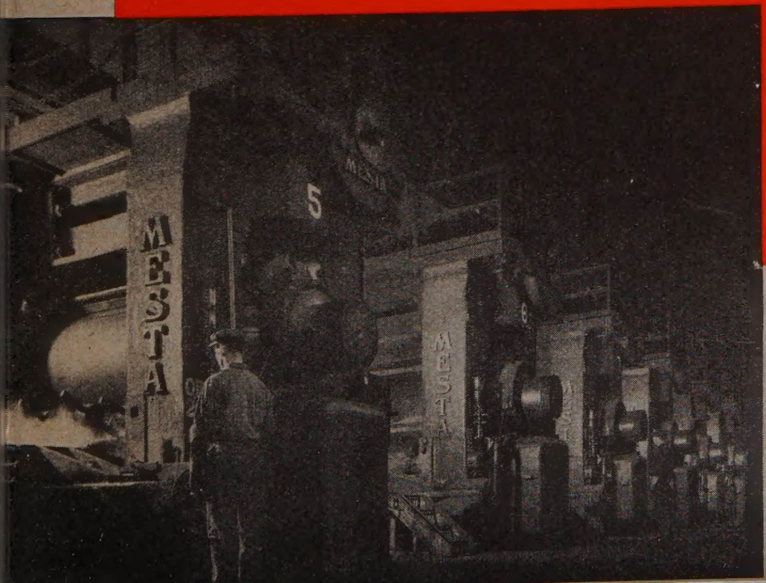
Mesta 68" Four-High Continuous Hot Strip Mill



Mesta 79" Four-High Continuous Hot Strip Mill



Mesta 56" Four-High Continuous Hot Strip Mill



Mesta 96" Four-High Continuous Hot Strip Mill

Designers and Builders of Complete Steel Plants
MESTA MACHINE COMPANY
PITTSBURGH, PA.

look-
no hands!

THIS IS
YOUR HEATING SUPERINTENDENT
WHEN YOU HEAT
WITH DRAVO HEATERS

It's an *automatic* fireman who goes on the job at the flip of a switch for the Sanatex Company of Chicago. It cuts operational and maintenance expense to the bone and solves what had appeared to be an expensive heating problem for this processor of wiping cloths.

Not only is an attendant unnecessary—boiler-room and ductwork expense was eliminated, too, by installation of a Dravo *Counterflo* Heater. Centered along the east wall, the Dravo *Counterflo* Heater is entirely self-contained—requiring only power and fuel lines and a small vent stack. Its 1,000,000 BTU output is directed slightly over the heads of the workers to blanket 10,000 square feet of unbroken plant area with draft-free warm air. Cold corners and excessive roof heat loss are eliminated. During summer months, a touch of the selector switch converts the Dravo *Counterflo* Heater immediately into a powerful air-circulating unit.

Dravo *Counterflo* Heaters are available in sizes ranging from 400,000 to 2,000,000 BTU output. Equally efficient with oil or gas and with or without ductwork, they can be floor-installed, wall-hung or roof-hung. Write for Bulletin HT-516. Heating Section, Dravo Corporation, Dravo Building, Pittsburgh 22, Pennsylvania.

According to Mr. Schulman, President of Sanatex Company, the Dravo *Counterflo* Heater "is the best equipment we ever had. Delivery of heat is virtually instantaneous when the unit goes into action—an important fuel-saving feature which eliminates the need for anticipating cold spells or keeping the heater in operation when the plant is closed."

Dravo also manufactures the *DRAVO CRANE CAB COOLER* for air conditioning hot-metal crane cabs

DRAVO CORPORATION

PITTSBURGH • CLEVELAND • PHILADELPHIA • DETROIT • NEW YORK • CHICAGO
ATLANTA • BOSTON • *Sales Representatives in Principal Cities*

Dear Editor:

CONSTRUCTION STEEL

Sir:

Newsfront in the sept. 7 issue discussed briefly experimental studies with a newly developed steel having better notch impact resistance than conventional construction steels. Kindly forward us more detailed information on this.

J. V. BERTRAND
Director
Loewy Research & Development Div.,
Loewy Construction Co., Inc.
New York

● More information on the steel is given in a two-part article "New Steel Features High Strength and High Toughness," scheduled for the Oct. 7 and 21 issues.—Ed.

TOOL STEEL DIRECTORY

Sir:

Please send me one copy of your "Directory of Tool Steels" and two copies of "Practical Tool Room Heat Treatment."

W. T. HUNT
Metallurgist
Chrysler Corp., Kokomo Plant
Kokomo, Ind.

METAL FINISHING

Sir:

We are enclosing our check in the amount of $3.00 to cover the cost of one copy of the Metal Finishing Manual.

L. FUHRKEN
Industrial Research Products, Inc.
Franklin Park, Ill.

IDENTIFYING METALS

Sir:

We will appreciate your mailing us the following tear sheets: "Identifying Metals," Oct. 17, 1946 issue; "Welding of Nickel-Alloy Steels," Feb. 14, 1946 issue; and "Bonding Aluminum to Ferrous Metals," July 1 issue.

WM. JONES
Canty & Coburn Co.
Norfolk, Va.

● Tear sheets have been mailed.—Ed.

PRODUCTION CONTROL

Sir:

It will be appreciated if you will send a copy of "Putting Production Control to Work" as it appeared in your May 16, 1946 issue.

R. G. FENNEMA
Production Control
E. W. Bliss Co.
Salem, Ohio

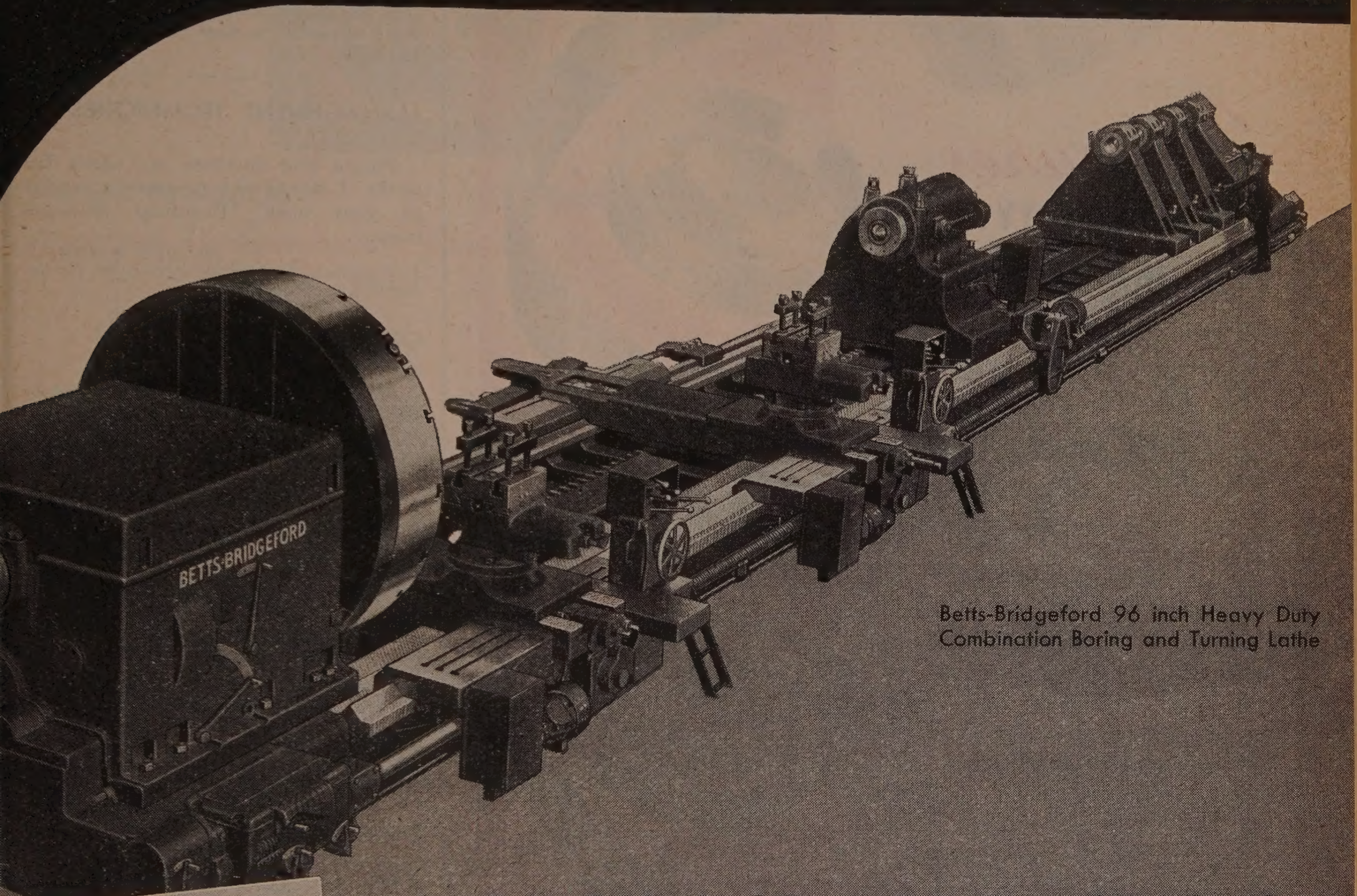
● Tear sheets are in the mail.—Ed.

QUALITY CONTROL

Sir:

We ask you to forward the following articles: "Statistical Method of Quality Control," from your May 11, 1944 issue, "Thread Rolling—Theory and Practice," from the Dec. 19 and

BETTS-BRIDGEFORD
Heavy Duty Geared Head
LATHES



Betts-Bridgeford 96 inch Heavy Duty Combination Boring and Turning Lathe

Betts-Bridgeford Heavy Duty Geared Head Lathes are built from 26 to 144 inch swing and larger

An earnest effort to produce the world's finest heavy duty machine tools has gone far to establish Consolidated's enviable reputation for designing and building heavy duty geared head lathes . . . a record of achievement extending back to the first Betts-Bridgeford Geared Head Lathe built in 1905. Today's Betts-Bridgeford Lathes have every advanced feature required for modern high production, accuracy and durability.

Full information covering any size Betts-Bridgeford Heavy Duty Lathe will be furnished upon request.

mong Heavy Machine Tools built by Consolidated are . . . .

LATHES
BORING MILLS
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SLOTTERS
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AND OTHER SPECIAL MACHINES

BUILDERS OF HEAVY DUTY MACHINE TOOLS SINCE 1848

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CONSOLIDATED
MACHINE TOOL CORPORATION
ROCHESTER 10, NEW YORK

Measures
OF QUALITY . . .
MADE OF
pre-coated
ThomaStrip

A large manufacturer of rules and steel tape measures uses two types of pre-coated ThomaStrip in the products shown here. The clamps (hinges) of the rules are made of brass coated ThomaStrip, and this brass coating serves as an ultimate finish. Here pre-coated ThomaStrip eliminates costly plating operations after forming.

The tape measure cases are made of copper coated ThomaStrip, and in this application the copper serves as a lubricant for the dies, a rust protection during fabrication, and a base for further plating.

When ThomaStrip's versatility goes to work for you, it means cost-saving production. Share our broad experience in developing newer, better manufacturing short cuts.

ELECTRO-COATED ZINC,
COPPER, NICKEL, AND BRASS . . .
HOT DIPPED TIN AND LEAD ALLOY . . .
LACQUER COATED IN COLORS . . .
UNCOATED PRECISION STRIP,
CARBON AND ALLOY SPECIALTIES

THE THOMAS STEEL COMPANY
WARREN, OHIO

26, 1946 issues and two articles—"Tool Standardization Program at G. M." and "The Tool Engineer"—from the March 11, 1948 issue. If there are any charges please bill us.

M. E. GREENE

Gits Bros. Mfg. Co.
Chicago

● Copies of the articles have been sent. There is a charge ($1.00) only for the article on thread rolling which we were obliged to reprint to meet the heavy demand for copies.—Ed.

MANAGEMENT TECHNIQUES

Sir:

Please find enclosed my check for $3.00. I would like to receive a copy of your book "Practical Management."

ELMER ISGREN

LeTourneau Technical Institute of Texas
Longview, Texas

OXYGEN IN BESSEMERS

Sir:

Will you please send me tear sheets for the article "Oxygen in Side Blown Converters," from your Sept. 2 issue.

M. J. R. MORRIS
Director of Research

Republic Steel Corp., Central Alloy District
Massillon, Ohio

FINANCIAL ANALYSIS

Sir:

Could you please send me a reprint of "THE IRON AGE Financial Analysis of the Steel Industry, 1947-46 which was published in the April 8 issue.

J. A. HOUSTON

Jos. T. Ryerson & Son, Inc.
Chicago

THREAD ROLLING

Sir:

You will find enclosed $1.00 for a reprint of your 20-page article covering thread rolling, namely "Thread Rolling—Theory and Practice."

ROBERT W. WEEKS
President

Wind Turbine Co.
West Chester, Pa.

PRECISION CASTING

Sir:

Enclosed you will find $1.00 for which we would like to receive a copy of your booklet "Precision Investment Casting—Lost Wax Process."

J. T. LOONEY
Plant Engineer

Ohio Injector Co.
Wadsworth, Ohio

SOFT METAL HARDNESS TESTS

Sir:

Would you be so kind as to send me two copies of the article from the June 24 issue entitled "Hardness Testing of Soft Metals."

A. SCULLY
Metallurgist

Noranda Copper & Brass Ltd.
Montreal

● There has been such a demand for the article that we can furnish only one tear

PRODUCT-PROVED STEEL . . .
SOLD UNDER WELL-KNOWN TRADEMARKS

CONTINENTAL STEEL

Wire Products

- Farm Fence
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- Nails
- Staples
- Manufacturers' Wire

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● Hundreds of manufacturers . . . both large and small . . . are building or strengthening their business reputations on products made entirely or in part from Continental steel. Their faith in Continental quality is attested to by the fact that they place their own valuable trademarks on these products in which Continental wire or sheet steel is used.

Sold under Continental's own well-known trademarks, are many wire or sheet steel products made in our plant for farm, home and industrial markets. These trademarks have been established through fifty years of steel-making progress. Write Continental at Kokomo for further information.

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Flame-Sealed
TRADE MARK REG. U.S. PAT. OFFICE
AGAINST RUST
AND GUARANTEED!

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WASHBURN*
EGG BASKETS

made of
KEYSTONE WIRE

Rubber-Coated Farm Basket for potato harvesting and general crop handling

**The Washburn Company*
Rockford, Illinois

Rubber coated egg baskets manufactured by the Washburn Company minimize egg breakage . . . cool eggs quicker . . . reduce handling costs . . . and help poultrymen get premium prices.

These especially designed baskets are constructed of dependable, uniform Keystone wire that has proper ductility for easy forming . . . a clean, bright surface for spot welding and rubber adhesion.

The efficiency of Washburn Rubber Coated Baskets is matched by sturdy construction . . . important reasons why Keystone wire is the choice of the manufacturer.

Whatever your wire need . . . Keystone can normally supply it.

KEYSTONE
MUSIC SPRING WIRE
KEYSTONE STEEL & WIRE CO.
PEORIA, ILLINOIS

SPECIAL ANALYSIS WIRE
for all industrial purposes

KEYSTONE STEEL & WIRE CO., Peoria 7, Ill.

sheet copy. We hope this will be satisfactory.—Ed.

HEAT RESISTANT ALLOYS

Sir:

Enclosed you will find a money order in the amount of 60¢ for which please send three reprints of "A Summary of Heat Resistant Alloys from 1200° to 1800°F" as it appeared in your issues of March 18, April 8 and 15.

THIEL DWYER
Research Engineer
Ekstrand & Tholand, Inc.
Carlstadt, N. J.

TIME STUDY COMPUTATIONS

Sir:

I would appreciate it very much if you would forward a set of tear sheets of the article "The Right and Wrong of Time Study Computations" which appeared in the Aug. 17, 1944 issue.

D. LORD
Dept. Foreman, Polishing & Sandblasting
Stewart-Warner Corp.
Chicago

- Tear sheets have been mailed.—Ed.

PIPE AND TUBE MAKERS

Sir:

We would greatly appreciate receiving a list of pipe and tube manufacturers located in the U. S., if you have such a list available.

H. L. DANA
President
Dana Steel Sales Co.
Tulsa, Okla.

- The list is on its way.—Ed.

TOOL STEEL CHARTS

Sir:

Please send us a copy of the article "Comparative Tool Steel Brands," which appeared in the July 29 issue.

M. R. McCURRY
Fulton Sylphon Div.,
Robertshaw-Fulton Controls Co.
Knoxville, Tenn.

- The heavy demand for this article has exhausted our supply of tear sheets. However, the new edition of the "Directory of Tool Steels" includes the article. The price of this booklet is $2.00.—Ed.

"SHADOW BOXING"

Sir:

The editorial "Shadow Boxing" in the Sept. 2 issue is very interesting. If available, I shall appreciate your sending me about 10 or 12 reprints or tear sheets.

JUDSON S. HUBBARD
Humphreys Investment Co.
Denver

- A dozen tear sheet copies have been sent.—Ed.

VACUUM MELTING

Sir:

Will you please send us two reprints or tear sheets of the following articles: "Vacuum Melting Tech-

GLOBE WELDING FITTINGS

. . . produced from Globe Steel Tubes by the Globe precision process

When you specify and use Globe Welding Fittings you will have the product of an organization with unusually broad metallurgical experience. Globe's precision-process method of production reaches back to the manufacture of the Globe seamless tubes themselves which are the "raw material" of Globe welding fitting fabrication.

Send for the Globe Welding Fittings Catalog—and look to Globe as a preferred source of supply.

GLOBE STEEL TUBES CO.
Milwaukee 4, Wisconsin

Producers of Globe seamless stainless steel tubes — Gloweld welded stainless steel tubes — carbon — alloy — seamless steel tubes — Globeiron seamless high purity ingot iron tubes — Globe welding fittings.

GLOBE
PRECISION PROCESS
WELDING FITTINGS

"Hybrid Metallurgy"

IMPROVES ON NATURE, TOO!

The wonders wrought by scientists in agriculture, horticulture and animal husbandry have become commonplace. By crossbreeding plants and animals, we have grapefruit, hybrid corn, heavy cattle and hogs—hundreds of marvels which Nature alone could never produce.

The same is now true in metals. Fansteel metallurgists using powder metallurgy and other techniques far beyond simple alloying, are producing "hybrid" metals which enhance desirable properties and suppress undesirable characteristics to almost any desired degree. For example, there are Fansteel metals ideally suited for current-carrying springs because of their superior elastic and electrical properties, as well as their resistance to annealing and drift. Another Fansteel metal has most of the density of tungsten, yet is easily machined, making it useful as flywheels and governors for rotational control, shields on containers for radioactive materials and similar applications.

For these metal product problems where no solution appears to exist, why not get acquainted with Fansteel metallurgy. Tell us the properties you need. We may have a metal that will meet the requirements exactly and can fabricate it to your exact specifications. Fansteel Metallurgical Corporation, North Chicago, Illinois.

PURE METALS
Tungsten, Molybdenum, Tantalum and Columbium in sheet, rod, wire and special shapes and parts.

POWDER METALLURGY PRODUCTS
Finished or semi-finished shapes and parts of special analysis to achieve high strength, density, electrical conductivity, resistance to wear, impact, heat, erosion, or combinations of these and other properties.

COPPER BASE ALLOYS
Copper alloyed with other elements, to combine high conductivity with strength, elasticity, resistance to heat, impact or wear. Available in bars, rod, sheet, strip, castings, forgings, finished or semi-finished parts, for electrical hardware, current-carrying springs, resistance welding electrodes, dies and fixtures.

Fansteel
SPECIAL PRODUCTS
In Controlled Metallurgy

niques" from the March 18 issue and "Powder Metallurgy as Applied to Permanent Magnets" from the April 8 issue. This material would be very helpful to us in our laboratory.

A. STANTON
Powder Metallurgy Laboratory
Stevens Institute of Technology
Hoboken, N. J.

X-RAY INSPECTION

Sir:

Kindly let me have a copy of the article "Radiographic Practice at Ford," which appears in your issue of July 22.

HERBERT R. ISENBURGER
St. John X-Ray Laboratory
Califon, N. J.

INVESTMENT CASTING

Sir:

Please forward your booklet on "Precision Investment Casting—Lost Wax Process" and also tear sheets of "Pertinent Data on Alloys Commonly Cast in Investment Molds" from the May 13 issue.

LESLIE T. SCHAKENBACH
Product Methods Engineer
Sperry Gyroscope Co., Inc.
Great Neck, L. I., N. Y.

MALLEABLE CASTINGS

Sir:

We would greatly appreciate receiving tear sheets of the article "Annealing Malleable Iron Castings" from the Aug. 19 issue.

H. C. FRIEDEMANN
American Electro Metal Corp.
Yonkers, N. Y.

MICROFINISHES

Sir:

The writer would appreciate your advising us who to contact for information on the meaning of the various microfinishes.

ALFRED HUBER
Engineer
Jersey City Welding & Machine Works, Inc.
Jersey City

● The booklet "Surface Roughness, Waviness and Lay Gage Blanks," published by the American Standards Assn., New York, describes standards for the measurement of surface finish. For practical shop techniques, the following IRON AGE articles should be helpful: "Measuring and Designating Surface Finish," Oct. 19, 26 and Nov. 2, 1944, and "Surface Finish Measurement Instrumentation," Mar. 20, 1947.—Ed.

TRADE NAMES

Sir:

I am interested in obtaining a copy of "10,000 Trade Names" which I understand you have published. Any information you can give me as to cost and availability of this book will be greatly appreciated.

M. J. R. MORRIS
Director of Research
Republic Steel Corp.
Massillon, Ohio

● Copies of the book are $3.00 each.—Ed.

The IRON AGE

Vol. 162, No. 15

October 7, 1948

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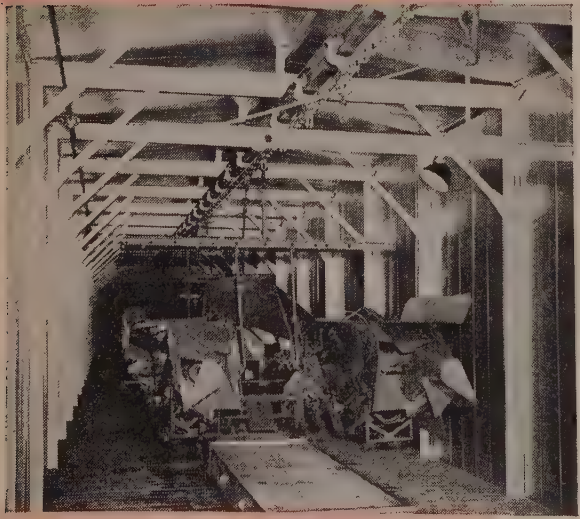
COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT

Mahon Finish Baking Oven Built Outside of the Plant Adjacent to the Building Housing the Remainder of a Complete Mahon Finishing System at the East Moline Plant of John Deere and Company. The Complete System includes a Six Stage Metal Cleaning and Rust Proofing Machine, Dry-off Oven, Hydro-Filter Spray Booths and the Finish Baking Oven Illustrated Above.



Interior of the Mahon Finish Baking Oven, Illustrated Above, Showing a John Deere Double Row Corn Picker Carried on a Continuous Overhead Trolley Conveyor.

Oven Installation Outside of Plan
Saves Valuable Manufacturing Space

In order to save valuable floor space inside of the plant, and t obtain an efficient oven design unhampered by restrictions normall encountered in planning ovens inside of industrial plants, this finis baking oven, which is part of a complete Mahon Finishing System was installed outside, adjacent to the building housing the remainder of the system. This is another example of Mahon Planning an Mahon Engineering. When you are considering new finishing equipment, remember that in a Mahon system you get better planning better engineering, and therefore a better finish at lower cost . . because, twenty-seven years of experience, pioneering development, and constant research, in this highly specialized field, ha endowed Mahon engineers with a wealth of technical knowledg and practical know-how not available to you elsewhere. Se Mahon Insert in Sweet's Mechanical Industries File for complet information, or arrange consultation with Mahon engineers.

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The Season of Doom

IN the late Saxon and early Norman period of English history, the word "doom" was associated with the power of the sovereign. The written codes which Alfred promulgated were known as Dooms. In the closing years of William the Conqueror a group of officials, moving from hundred to hundred and shire to shire, gathered information regarding the ownership of land, its value, the contribution of Danegeld, and other items which would give the sovereign information regarding the wealth of his subjects and particularly their ability to bear taxes.

The two thick volumes into which this mass of statistics was compressed was known as the Doomsday Book. Possibly it is this association with taxation which has given the word "doom" its present sinister connotation of death, ruination, final judgment.

Eight centuries ago the word "doom" was associated with information used by the sovereign for levying taxes. It is little wonder that the word today carries a note of fateful and inexorable disaster. Appropriate as the word may be when applied to taxation, we suggest that it describe the fall of the year.

Instead of autumn, let it be known as the season of doom. This is the time of the year when the scientists and the clerics gather in annual session. Their well-publicized deliberations invariably detail the awful fate awaiting men. This fall has been no exception. We have already noted the comments of the Amsterdam churchmen on Capitalism which, according to these men of the cloth, has as little to recommend it as the pagan ideology of the communists.

We now learn from another group of pontifical pundits that we are doomed to starvation because the world cannot raise enough food for the population it will have to feed in the near future. Some years ago —to be specific it's more than a hundred—a fellow named Malthus propounded a "scientific principle" to the effect that the food of the world increased arithmetically while the population mounted by geometric progression, so that food constituted an absolute limit to the world's population.

Malthus has been dead a long time and if he was right his timing was off by at least a century and a half. This is a rough measure of the accuracy of scientific prognostication wherever it affects the fate of men.

The fact is that man—and this applies especially to the *homo Americanus*—has, in the parlance of the ring, unsuspected whiskers. He can take it.

We applaud especially his talent for thumbing a nose at the scientists. During 1947 our people added a total of 3.9 million babies to our population. They are in process this year of building a million new homes. More than half of all our workers save a part of their income for the future. They have faith in it.

Our business leaders in 1947 invested $16 billion in new plants and equipment, a bet that our civilization will not fall on its face tomorrow.

The sale of life insurance, the holdings of government bonds, the impressive aggregate of savings—all these are a tangible wager by the American public that the scientists, with all their burden of learning, at times do not know the way to go home.

Autumn is simply the season when they sound off, when they prostitute their learning and intelligence for a paltry bit of spotlight. Let these Jeremiahs thunder. It is the season of doom.

Joseph Stagg Lawrence

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INLAND 4-WAY FLOOR PLATE

IRON AGE NEWSFRONT

Oct. 5, 1948

► Some ferroalloy producers feel that they have found a way to sell on a uniform delivered price basis. They are selling f.o.b. the customer's plant. Their legal departments have informed them that it is legal to sell one price any place in the country and absorb freight as long as they maintain legal possession of the product. In other words, as long as they legally own the product, they can do anything they want to with it before selling it--they think.

► The thrust output of jet engines may be raised as much as 40 pct at takeoff and up to 100 pct under high speed and high altitude conditions by reheating the exhaust. This is done by burning extra fuel in the exhaust system. Injections of water and alcohol in the combustion system also increase thrust.

► Some smaller steel companies have found it necessary in recent months to raise steel prices somewhat above regular mill prices. The major reason for this move is to get more money to make repairs, improvements and additions. Banks are not always on the little guy's side. Many of the smaller mills have no ore and no iron and have to pay high scrap prices. So look for higher prices from some small mills as long as demand holds up and maintenance, repair and new equipment have to come out of income.

► The Franco-American Metals Co. (COFRAMET) has begun preliminary work to open ore mines near Konakry in French West Africa. Iron ore reserves are estimated to be several billion tons. Mining is to begin at the rate of 3 million tons a year. Output will be exported to the United States and England.

► Non-left members of the CIO know whereof they speak in their strong stand against communism. Some of their top officials several years ago got their bellyfull when they visited Russia. What they saw they filed in their minds and some may have jotted down some notes. They definitely did not like what they saw. That's why they glare militantly at fellow travelers and deep red members in their own group.

► Latest reports show that there are many more companies making conversion ingots than there were a few months ago. The list now includes some tool steel producers who melt small carbon steel ingots and a few fair sized steel consumers. Some other consumers are in the market for small electric furnaces to do the job.

► Oil companies are paying some fancy prices for plate to be made into pipe. Aside from that which is purchased on the gray market in excess of $200 a ton they are also paying for "special" plate as much as $140 a ton. This plate is then fabricated into large diameter pipe. Oil companies who want pipelines now, not 3 years from now, are paying the price--when they can get the steel fast. They also have an eagle eye trained on Ruhr pipe output. It won't go begging even if the price comes pretty high.

► New auto model introduction schedules are lining up at present in the following order: Nash will introduce in October; Buick will probably be first among GM divisions and Pontiac will probably not come out until January, following Chevrolet. Most Detroit sources have written off a Chrysler introduction earlier than January 1949. The so-called GM "B" body used by Olds, Pontiac and Buick probably will not be changed until later in 1949.

► Because of inferior quality coke, steel producers last year used 154.8 lb more coke to make a ton of pig iron than they did in 1941. This meant that 4½ million more net tons of coke were consumed last year than would have been necessary if the furnaces had operated at the 1941 rate of fuel efficiency.

► Lead in steel, which has been used in the past to increase machinability, is destined to become much more important than it has been to date. The continuous casting process permits a much better distribution and control of that lead content than do conventional steelmaking methods. Stainless steel is a natural for this process and this fact will be exploited to the utmost.

► The Japanese government has signed a contract for Japan's first postwar import of iron ore from South America. The contract calls for shipment of 250,000 tons of high grade ore from Rio de Janeiro to be delivered between October 1948 and February 1949.

Effect of Welding Practice

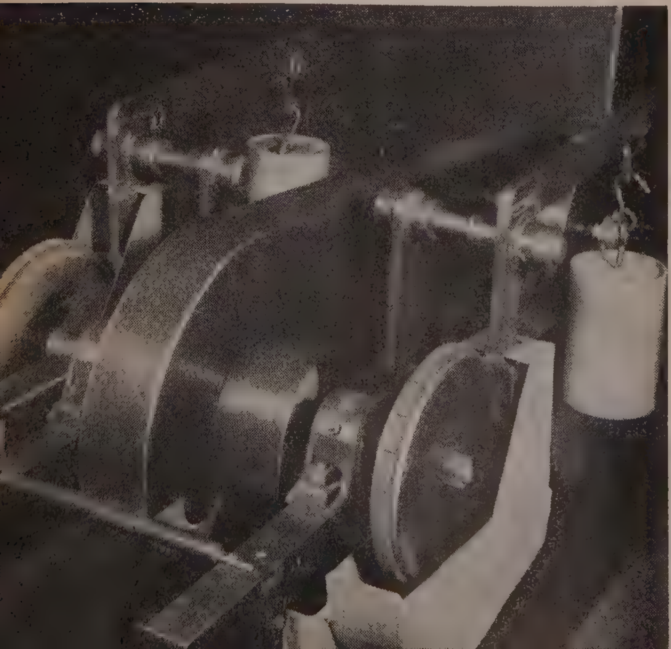
Resistance Of Hard

By ROY D. HAWORTH,
Supervisor, Abrasion Research,
Armour Research Foundation,
Illinois Institute of Technology,
Chicago

o o o

WHEN properly applied with a judicious selection of the material deposited, hard facing can lead to a considerable improvement in the service life of equipment compared with that which would be obtained with the base material alone. This discussion is concerned only with wear by sliding abrasion, that is, wear of metal from the surface of equipment used for digging, handling, or moving extraneous abrasive materials such as coke, earth, ores, and sand. The wear obtained on paddles used for mixing sand would be illustrative of this type of wear.

FIG. 1—View of the abrasion testing machine with retaining covers removed to show how the test specimens are held in a slot in a vertical position against the wheel periphery.



Electric arc deposition is the quickest and least expensive procedure for hard facing, particularly where large surfaces are to be covered. To avoid excessive overheating of small parts and burning of thin sections, and to obtain closer tolerances, oxyacetylene or gas deposition is used. Certain rod materials are too sluggish to flow freely with oxyacetylene welding except with the use of special fluxes, and for these materials atomic hydrogen welding is sometimes employed. The most commonly used methods, however, are the electric arc and oxyacetylene. The purpose of this article is to present some informative data concerning the abrasion resistance of materials deposited by these two methods.

Greater dilution of the facing material with the base metal obtained in arc compared with that of oxyacetylene deposition has been previously discussed. However, the effect of this greater dilution on the resulting abrasion resistance has not been shown quantitatively. Certain electrodes are designed to compensate for this dilution, but this allows only for average conditions of deposition.

The effects of the welding method on the abrasion resistance of commonly used hardfacing materials has been demonstrated clearly in abrasion tests conducted at Armour Research Foundation of Illinois Institute of Technology. These results, confirmed by service tests, show that abrasion resistance of arc deposited hard facing will be inferior to that obtained by gas deposition. Reasonable precautions must be taken to avoid the use of an oxidizing flame in gas welding with high carbon materials to prevent loss of this important element. Also, the use of a highly reducing flame must be avoided in lower carbon materials to avoid undesirable carbon pickup from the flame.

On Abrasion Facings

Gas deposition of hard-facing material frequently gives better sliding wear resistance than arc deposits, even in thinner coatings, investigations at Armour Research Foundation have revealed. Details of the tests, which embraced both gas and electric arc deposits, and an interpretation of the results are given in this article. Suggestions on how arc deposits can be adjusted to give better abrasive resistance and a description of a new abrasion testing machine are included.

○ ○ ○

PHOTOGRAPH of a dry-abrasion test, with retaining covers removed, of the Armour Research Foundation abrasion testing machine taken with an exposure of 0.0001 sec.

A comprehensive survey of the literature on the subject of abrasion conducted by Armour Research Foundation indicated the need for development of a laboratory abrasion testing device for evaluating rapidly and reliably materials used in abrasive applications. Accelerated testing machines have been devised for this purpose, but none of them was felt to be sufficiently versatile to provide useful data for a wide range of applications. Incorporating some of the better ideas uncovered by the survey with some original thoughts led to the development of a machine which may be used to predict accurately the relative performance of different metals under a variety of abrasive conditions.

The machine, as ultimately developed, consists of a rubber wheel, approximately 9 in. diam, rotating through the abrasive material which, in turn, is picked up and dragged across the test specimen. The machine is shown in fig. 1. Specimens, 3 in. long x 1 in. wide x approximately ½ in. thick, are held against the periphery of the wheel by a weighted lever arm. The wheel is uniformly notched to aid in carrying the abrasive material. Tests may be run either dry or wet (in slurry form) and at various speeds and pressures. The abrading media are used in granular form, usually from 28 to 35 mesh.

Perhaps the most unique innovation of the machine is the use of a rubber wheel for carrying the abrasive. Under pressure from the specimen the wheel flattens out, providing an initial contact area about 2 in. long. The unit pressure, therefore, decreases only moderately as wear on the specimens progresses. Moreover, because of the elasticity of the rubber, high unit pressures on the abrasive grains are avoided, eliminating crushing of low strength nonmetallic materials. Tests run with a steel wheel under the same abrasive conditions show results in a different order; results that are not comparable with service data involving sliding abrasion in the absence of severe impact and heavy pressures. The rubber wheel

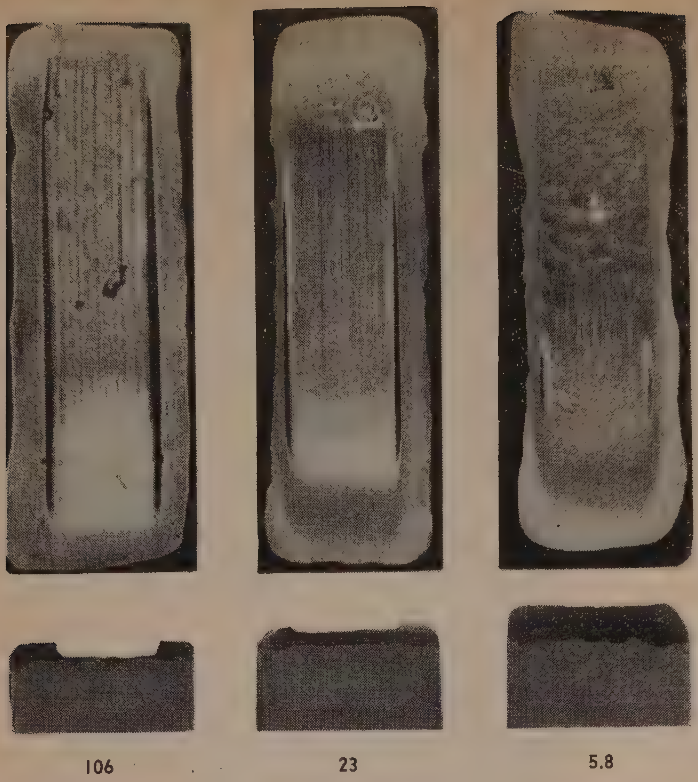


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FIG. 2—The effect of thickness of arc welded deposition is shown in these abrasion test specimens. Numbers shown under the specimens are weight loss values obtained in 28 to 35 mesh dry crushed quartz tests at a surface speed of about 600 fpm and a testing time of about 6 min, or a total of 4000 ft of lineal wheel travel.

○ ○ ○

results are quite accurate in predicting service performance under such conditions.

Results normally are reported in terms of loss in weight in grams x 10. This factor is employed to obtain whole numbers for the more abrasion resistant materials. Tests usually are run in duplicate and reproducibility of results is normally within 10 pct. Typical wear patterns obtained are shown in fig. 2.

Some of the early abrasion test data obtained in the Armour investigations on arc deposited hard-faced specimens showed surprisingly poor abrasion resistance. When the same materials were gas deposited, superior results were obtained. Sectioning of the abrasion specimens disclosed that the arc deposited coatings were nearly all less than ⅛ in. thick. Further investigations revealed that heavier arc deposited coatings had abrasion resistance comparable with the same materials when gas deposited. Thickness of deposit did not appear to be an important factor in the abrasion resistance of oxyacetylene gas deposited coatings.

Illustrative abrasion test results made with dry crushed quartz are shown in order of increasing abrasion resistance in table I. These specimens were deposited from 3/16 in. rod at the average amperage recommended by the manufacturer. The inferior abrasion resistance of the arc deposited materials compared with the same compositions gas deposited are evident in the table.

The analyses shown in table I are either nominal values supplied by the manufacturer or were determined on builtup beads. Because of the varying amounts of dilution in the arc-deposited specimens, the abrasion results of these specimens cannot be correlated on the basis of the analyses shown. The gas deposited values, however, can be correlated with the analyses since the factor of dilution should be negligible and the compositions of the deposits, therefore, should be similar to those shown.

TABLE I

Abrasion Results on Hard-Faced Deposits

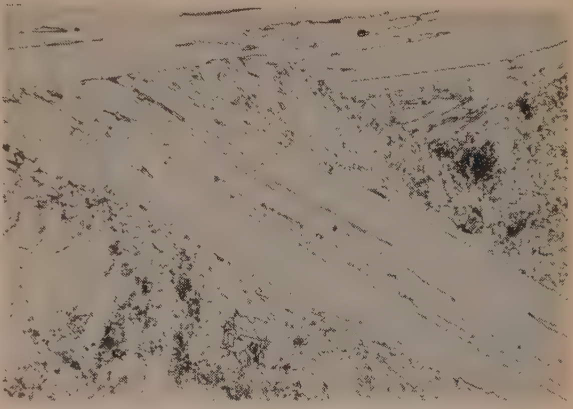
Obtained with 28/35 mesh dry crushed quartz at 250 rpm with a 40 lb load through a test distance of 4000 ft.

Test No.	Nominal Chemical Analysis, Pct							Welding Method	Approximate Deposit Thickness, In.	Hardness, Rc	Abrasion Weight Loss, (grams x 10)
	C	Si	Mn	Cr	Mo	W	Co				
1	Hardened SAE 1045 steel							. . .	. . .	59/62	130
2	1.40	....	....	27.5	. . .	4.5	55.0	arc	0.180	45/49	106
3	3.10	0.90	0.20	8.0	2.5	15.0	. . .	arc	0.110	56/60	42
4	3.75	0.80	....	7.5	1.75		. . .	arc	0.150	48/60	32
5	5.00	1.90	4.0	32.0	. . .	. . .	. . . .	arc	0.110	59/63	26
6	3.75	....	....	7.5	1.75	. .	. .	oxyacetylene	0.125	60/62	10
7	5.00	1.90	4.0	32.0		. . .	. .	arc	0.180	57/59	5.8
8	3.10	0.90	0.20	8.0	2.5	15.0	. .	oxyacetylene	0.090	57/60	5.7
9	5.00	1.90	4.0	32.0	. . .	.	. . .	oxyacetylene	0.110	59/63	3.5

* Average of two or more tests.

A

B



C

FIG. 3—These are the structures 1/32 in. below the test surface of high carbon-high chromium alloy deposits. (500X; Vilella's etch.) *A*—Single pass arc deposit. *B*—Double pass arc deposit. C—Triple pass arc deposit.

Comparison of the results on the three gas deposited materials in table I shows an increase in abrasion resistance as the alloy content is increased. However, the most abrasion resistant of the three also has the highest carbon content, which may be as important as its higher alloy content. The importance of carbon content in resistance to straight abrasion is clearly illustrated in the comparison of the expensive cobalt base material, No. 2 in table I, and the lower priced but higher carbon alloy, No. 7. Although both were arc welded, deposit thicknesses were identical and of sufficient depth so that the factor of dilution in the outer layers was probably minor. The chromium contents, likewise, were similar. In the presence of extreme heat, corrosion, or impact, the more expensive material might be superior to the other, but under the abrasion conditions in the laboratory tests the lower priced material was far superior.

Analyses were made of the average compositions of the outer 0.100 in. of arc deposited layers of various thicknesses of a widely used high chromium, high carbon hard-facing material. These analyses and the corresponding dry quartz abrasion resistance are shown in table II. Also shown in the same table is the effect on abrasion resistance of removing increasing amounts of a heavy arc deposited coating. Abrasion specimens illustrating the effect of coating thickness are shown in fig. 2.

The results in table II show increases in carbon and alloy content and abrasion resistance as the thickness of the deposit was increased. Conversely, the abrasion resistance of the heavy arc deposited specimen dropped sharply after approximately one half of the original thickness of the coating was removed. These results suggest that thicknesses of ⅛ in. or more are required by arc deposition to produce abrasion resistance in this alloy comparable with that obtained by even thin gas-welded deposits. Even though the arc deposit may be sufficiently thick to exhibit a high degree of abrasion resistance on the outer surface, its resistance is much lower in underlying layers where the factor of dilution is more pronounced.

The effect of dilution of the alloy rod with

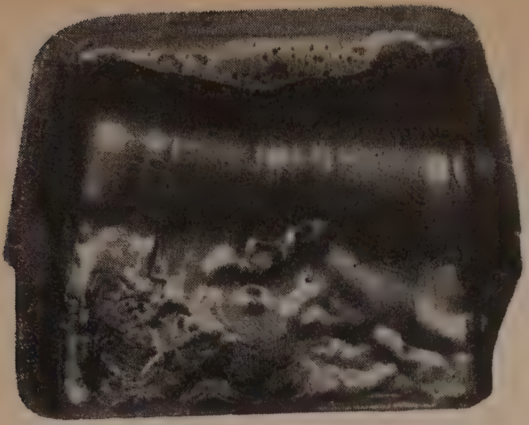
TABLE II

Abrasion Tests on Varying Deposit Thicknesses of High Carbon, High Chromium Welding Rod

Obtained with 28/35 mesh dry crushed quartz at 250 rpm with a 40 lb load through a test distance of 4000 ft.

Test No.	Welding Method	Deposit Thickness, In.	Hardness, Rc	Abrasion Weight Loss (grams x 10)	Average Chemical Analysis in Top 0.100 in., Pct		
					C	Mn	Cr
1	arc	0.090	50/52	106	2.04	2.27	10.10
2	arc	0.110	59/61	23	2.98	3.75	23.49
3	arc	0.180	57/59	5.8	3.49	3.80	26.29
4	arc	0.270	55/60	2.8	....	....	.....
5	arc	*0.200	60/61	4.0	....	...	.....
6	arc	*0.150	53/55	5.8	....	....	.....
7	arc	*0.090	56/58	88.0	....	....	.....
8	oxyacetylene	0.110	59/63	3.5	....	....	.....

* Specimens obtained by grinding successive amounts off specimen 4.



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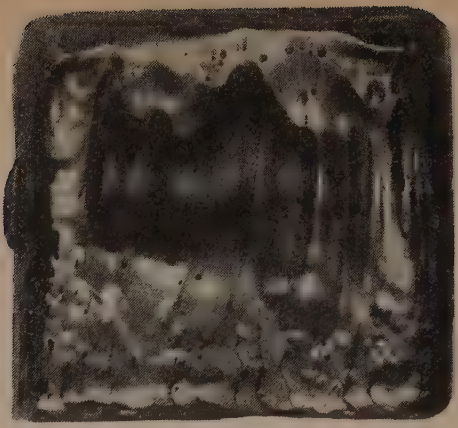

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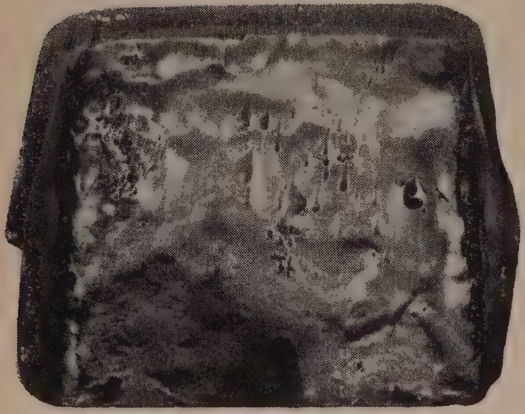


C

FIG. 4—Sandslinger tips were hard faced with a single pass gas deposit, a single pass arc deposit, and a double pass arc deposit of high carbon, high chromium alloy hard facing material and subjected on 1 hr constant service in a commercial steel foundry. *A*—Single pass gas deposit. *B*—Double pass arc deposit. C—Single pass arc deposit.

the base material during arc welding also is illustrated in the microstructures of the first three specimens listed in table II. Photomicrographs of these deposits, taken approximately 1/32 in. below the surface, are shown in figs. 3A, 3B, and 3C. The amount of coarse (hypereutectic) carbides increases sharply with increased deposit thickness These carbides, as determined by microhardness methods, are extremely hard. In fact, they are much harder than either quartz or the matrix microstructure, which explains the increase in abrasion resistance as their relative amount is increased. Throughout these tests, hardness, determined by the Rockwell method using a diamond indenter under a 150 kg load (C scale), was found to have little or no correlation with the abrasion results obtained.

TABLE III

Sandslinger Field Tests in Commercial Foundry

Test No.	Welding Method	Approximate Deposit Thickness, In.	Tip Wear During Constant Period Test, Grams
1	Arc (single pass)	3/32	355
2	Arc (double pass)	7/64	200
3	Oxyacetylene (single layer)	7/64	89

Under milder abrasive conditions, with less sharp edged particles or softer abrasive materials than crushed quartz, the difference in results shown in table I would have been less. The results, however, would be expected to be in essentially the same order. Wet abrasion also would produce lower weight loss values particularly in the less abrasion resistant alloys. With constant particle shape, abrasiveness increases with the hardness of the abrading material. However, within certain limits, angularity of particle shape may be more important than mineral hardness. For example, angular grains of crushed feldspar have been shown to be more abrasive than rounded grains of Ottawa sand. Similarly, crushed coke, in some recent tests on hardened SAE 1045 steel, has been shown to be equally as abrasive as the Ottawa sand.

The pronounced inferiority of the shallow arc deposited specimens indicated by the laboratory abrasion tests was confirmed by field tests. These were made by hard surfacing the tips, which are small scoops or buckets, used in the throwing head of a foundry Sandslinger. These tips revolve at high speed and present a severe abrasion problem.

Three tips were surfaced with the high carbon, high chromium hard-facing material, the laboratory results of which are shown in table II. One of these tips was coated with a single arc pass, a second with a double arc pass, and the third was given a single gas deposited layer. These tips were run for a constant period and removed to check weight loss. The results obtained are shown in table III.

In figs. 4A, 4B and 4C the worn tips are shown. Corresponding sections through the tips are shown in fig. 5. Wear in these tips is normally concentrated near the center. It is evident that both of the arc deposited facings were worn completely through and that a large part of the reported weight loss resulted in the underlying metal. For this reason the results are not directly comparable with the laboratory data shown in table II, but the predicted inferiority of arc deposits of this alloy in layers of less than ⅛ in. thick was confirmed.

For service involving repeated impact or moderately heavy pressure, advantage sometimes is taken of the dilution produced by arc deposition. In single pass layers, a sufficient increase in carbon and alloy content over that of the base material is achieved to impart improvement in abrasion resistance without the danger of spalling or breakage. To achieve the same end by gas deposition would require the use of a lower carbon rod material.

The investigation has disclosed that results inferior to those of oxyacetylene deposition may be obtained by arc welding unless certain precautions are followed.

For homogeneous welding electrode materials (as distinct from the tube type product containing tungsten carbide particles) and where the ultimate in resistance to abrasion is desired, arc welded deposits of at least ⅛ in. and preferably 3/16 in. thickness should be used.

Relatively shallow deposits of homogeneous alloys produced by oxyacetylene welding are more abrasion resistant than those of similar arc-deposited materials. Gas welding, therefore, when economically feasible may be preferable for such deposits. It is believed possible for manufacturers of hard-facing materials to adjust the composition of electrodes or coatings to overcome the effect of dilution or to minimize penetration of rod materials specially designated for light deposits.

In order to hold dilution with the base metal in arc welding to a minimum, the lowest possible amperage and largest practical electrode size should be employed.

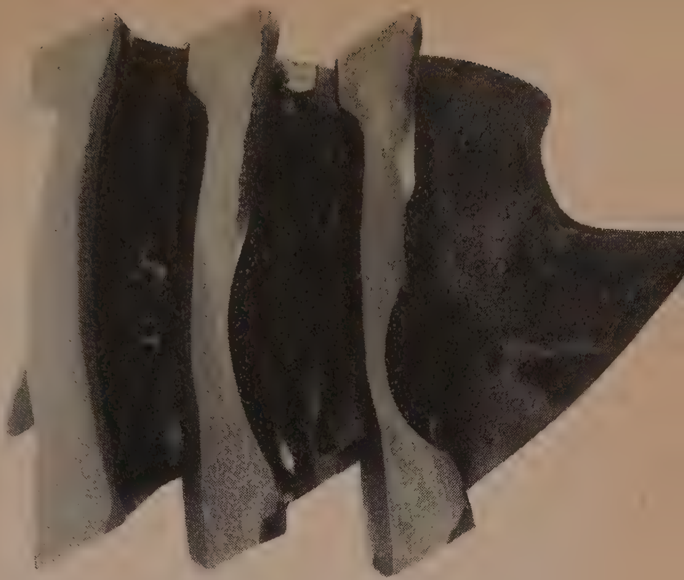


FIG. 5—Sandslinger tips shown in fig. 4, sectioned through, are shown here. Left to right are the gas, double pass arc and single pass arc faced tips.

. . . NEW BOOKS . . .

"How to Develop Competent Supervision." Three papers, "Development and Rating of Supervision," "One Million Management Spokesmen" and "Selection and Development of Foremen" have been included in this booklet. American Management Assn., 330 W. 42nd St., New York 18. 75¢. 34 p.

* * *

"Local Labor Market Research," by Dale Yoder, D. G. Paterson and Herbert Heneman. Book reports a study of the St. Paul, Minn., labor market. The techniques used are applicable to similar labor studies. University of Minnesota Press, Minneapolis 14. $3.50.

* * *

"The Ironworkers' Manual (Aus der Fachsprache des Eisenhuttenmannes)." Second edition of German-English, English-German dictionary is specifically designed to assist in the translation of material dealing with the metallurgy of iron and steel and mill practice. Stahleisen M. B. H., August-Thyssen Strasse 1, (22a) Dusseldorf, Germany. 2.75 reichsmarks. 106 p.

"Materials Handling." Manual describes modern methods of handling materials in receiving, shipping and warehousing operations, prepared to give an effective overall understanding of the many aspects of material handling. General Electric Co., 1 River Road, Schenectady 5. $1.00. 92 p.

* * *

"Metal Spraying and Sprayed Metal," by W. E. Ballard. Third edition of British book discusses molten metal, powder, wire spraying and special processes; preparation of surfaces for metal spraying; properties of metal sprayed surfaces and related subjects. American Metallizing Contractors Assn., 773 Brownell Ave., St. Louis 22. $10.00. 362 p.

* * *

"Plant-Wide and Geographical Salary Administration." Booklet contains texts of three papers presented at a personnel conference of the American Management Assn. and gives accounts of the discussion periods following. The papers included are "The U. S. Steel Corp. Wage Classification Program," "Salary Administration for Exempt Personnel" and "Geographical Salary Administration." Amer-Management Assn., 330 W. 42nd St., New York 18. 75¢. 42 p.

Precision Casting with

ALTHOUGH the utility of precision investment casting has long been recognized, parts produced by this technique have been rather costly due to the numerous production operations involved and the large amount of skilled hand labor required.

There appears to have been too wide a gap between the methods used in conventional precision castings and those used, for example, in turning out sand castings, diecastings and permanent mold castings. Pattern making has been costly and wax patterns have proved rather delicate to handle, assemble and invest. Molds also have been expensive, partly because of the high cost of ingredients, the hand work of precoating the patterns, of preparing the slurry in small batches and of handling the slurry and the molds made from it.

For several years engineers of the A.R.D. Corp. have been investigating methods of reducing or eliminating these handicaps. These investigations have led to the development of procedures which appear to have opened new competitive possibilities for precision investment casting. The first American licensee under A.R.D. methods, the Midwest Foundry Co., Divi-

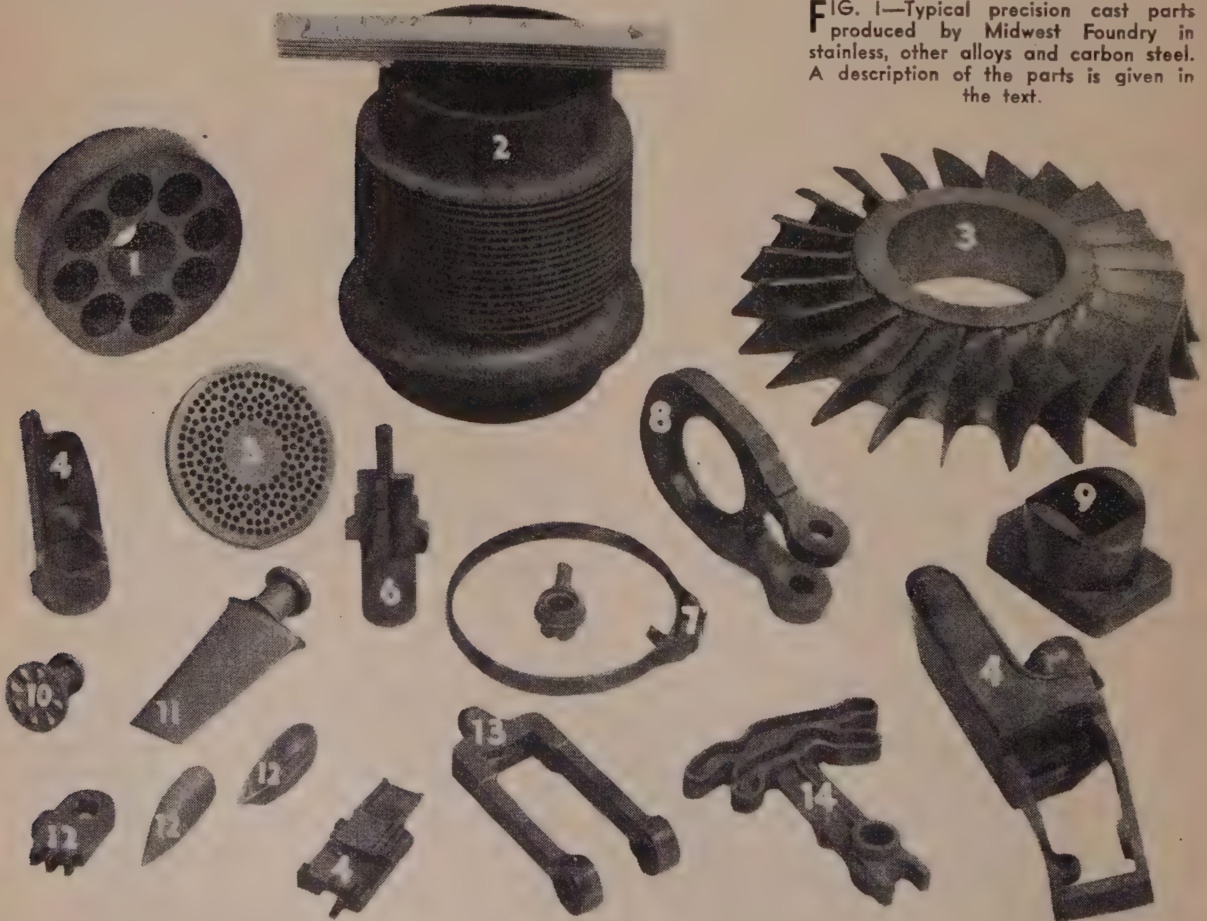


FIG. 1—Typical precision cast parts produced by Midwest Foundry in stainless, other alloys and carbon steel. A description of the parts is given in the text.

Plastic Patterns—

—the A.R.D. Process—

By HERBERT CHASE

Development of precision investment casting techniques which permit an unusually high rate of output with minimum labor requirements is reported in this article. Highlighting this new process, now in commercial operation, is the use of plastic patterns produced in automatic injection machines, automatic mixing of large batches of low-cost slurry, high-speed flask filling by use of a hose and the eliminating of precoating of patterns.

sion of L. A. Darling Co., Coldwater, Mich., now has a well equipped department in volume production of precision castings in several ferrous alloys. A similar plant is being readied for operation in Switzerland and a third is being planned for England.

Among the major objectives of the A.R.D. Corp.'s investigations was the development of techniques which would have the following characteristics:

(1) To make patterns rapidly on a semiautomatic basis and from a plastic moderate in cost, not fragile and which can be assembled into trees rapidly using unskilled mold operators.

(2) To produce molds, without precoating the patterns, from a low cost slurry capable of semiautomatic preparation in volume and in a form that can be held for any length of time, and run into flasks as rapidly as the flasks can be filled from a hose.

(3) To simplify mold drying and baking in equipment that is moderate in cost and easily used.

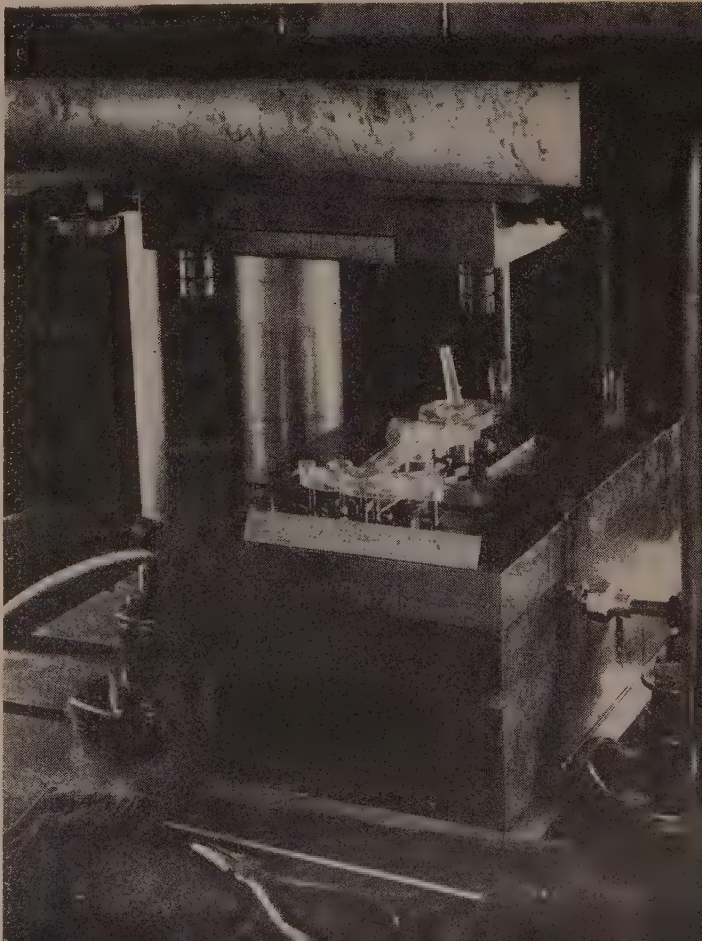
(4) To simplify melting and pouring procedures and attain a high yield and quality castings, in conformance with normal foundry practice.

The manner in which these objectives have been achieved is indicated in the following description of the setup of the A.R.D. process at the Midwest Foundry. Some typical steel casings produced by Midwest using the A.R.D. process are shown in fig. 1. The castings illustrated include (1) nozzle plate in 0.30 C steel; (2) cylinder barrel in 0.50 C steel; (3) compressor rotor in 18-8; (4) shotgun parts in 2330 steel; (5) meat chopper disk in 440 stainless; (6) high speed steel reamer; (7) propeller lock ring in nickel steel; (8) scale part in 0.50 C steel; (9) coupling in 18-8; (10) bazooka part in 0.20 C steel; (11) turbine blade in Co-Cr alloy; (12) textile parts in 2330 steel; (13) scale part in 0.50 C steel; (14) transmission shifter in 4150 steel.

Although some wax patterns are employed for development and short-run jobs that do not justify, or are preliminary to, the making of steel molds for producing plastic patterns, the latter are much preferred, largely because they are far easier to produce and assemble. Moreover, the plastic costs about one-third as much as suitable waxes. Plastic patterns are used, therefore, on all long-run jobs.

All molding of patterns is done in hydraulic

FIG. 2—Closeup view of the mold used for producing plastic patterns. Core pullers and the ejecter mechanisms are located in the lower die.



presses, the ejector mold half being attached to the lower movable platen and the other half to the upper fixed platen. Thus, there is no handling of molds, once they are put in the presses. Where needed, molds are provided with automatic core pulls and automatic pushout pins that lift patterns from the mold. The special polystyrene plastic used, as well as the press equipment and methods are the subject of pending patent applications.

Three specially built presses are now in use. Two are employed exclusively for plastic pattern production. One turns out the few wax patterns used and also makes wax sprue-hole plugs. Fig. 2 is a closeup of the dies used for producing plastic patterns, while fig. 3 is a general view of the three injection presses.

Each press operates on an automatic cycle which can be set for as many as three fillings a minute. However the cycle generally runs at about half this rate, or slower. The length of the cycle depends largely upon the time required for the plastic to solidify in the mold. It is longer for patterns that have thick sections than for those with thin sections.

Molds are kept cool by water circulated through drilled passages. Temperature of the plastic at the injection nozzle is set for the particular mold in use and ranges from 250° to 400°F. The optimum temperature depends on the mold used and is controlled automatically by electric resistance heating at the preset level. The maximum pressure for injection is 1000 psi as the plastic is not very viscous at normal molding temperatures.

Once the operator presses the start button, the press runs through its cycle automatically and leaves the operator free to cut the prior molding (or moldings if a multiple-cavity mold is used) from the sprue or runner and to assemble pattern moldings into trees when more than one pattern per flask is to be used. As soon as the mold is opened and the plastic pattern ejected, the mold is lubricated with a silicone solution and the button is pressed to start the next cycle. Plastic sprues and runners are ground up and reused.

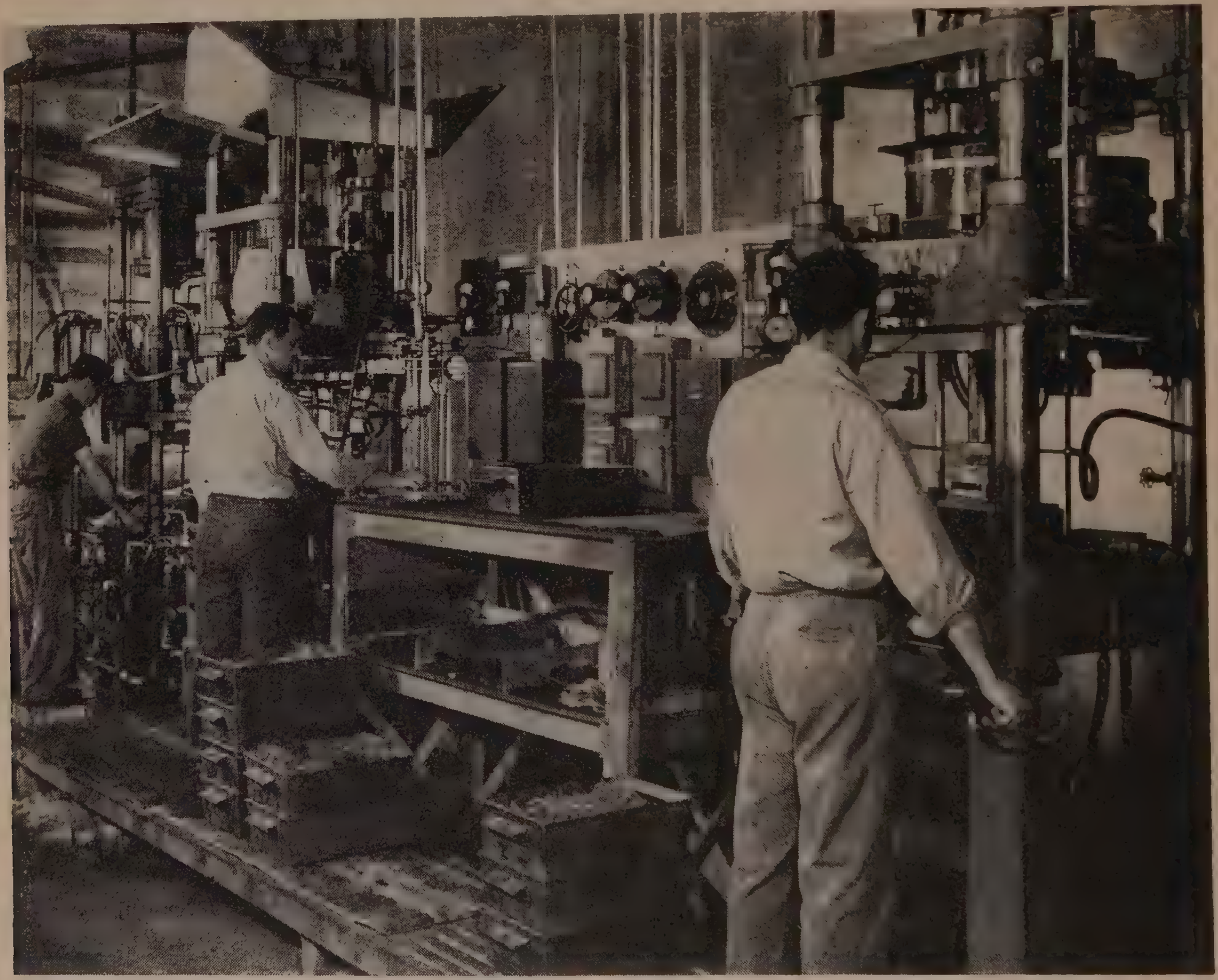


FIG. 3—Three injection presses designed specifically for making plastic patterns. Short-run wax patterns and wax spruo hole plugs are also made in the press on the far left.

Fig. 2 is a closeup of a mold in the press. Fig. 4 shows the two sections of a steel mold for a textile part. This mold has six cavities and a cam-operated side core for each cavity. Main cores are in the lower half of the mold and are made in two pieces because the cored recess has an undercut and one portion of it has to be moved to one side before the plastic pattern can be ejected.

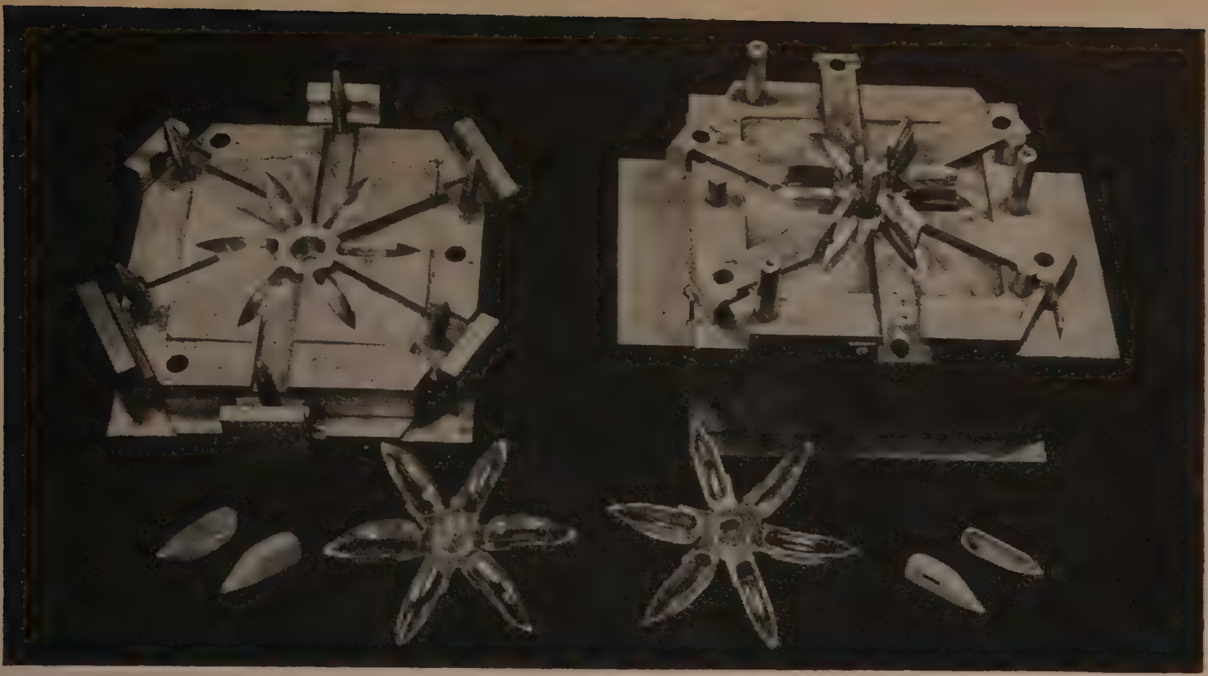


FIG. 4—Multiple cavity mold for producing plastic patterns for the textile part shown in the foreground.

Where molded patterns are to be assembled so that two or more cavities are formed in the investment mold, the patterns are molded with projections and recesses that mate or interlock. Thus, there may be a shallow boss on one side and a corresponding hole or recess on the other. Assembly then consists, as a rule, in pressing the boss of one molding into the recess of the next. A drop of solvent can be added if a hand pressed fit is not sufficient.

This assembly is far faster and more secure than the conventional fitting of wax patterns to form trees and it is almost impossible to bend or otherwise permanently distort the patterns. To cause distortion, plastic patterns require temperatures far above any encountered in molding or investing areas, hence distortion does not occur.

Plastic patterns are exceedingly smooth. This finish is not affected by handling and is imparted to the investment mold and results in castings of excellent as-cast finish. Plastic patterns can be gaged as if made from metal.

Patterns are ready for investing as soon as they come from the press and the small amount of labor for assembly, if needed, is done by the press operator while the mold is closed, thus using time which otherwise would be nonproductive.

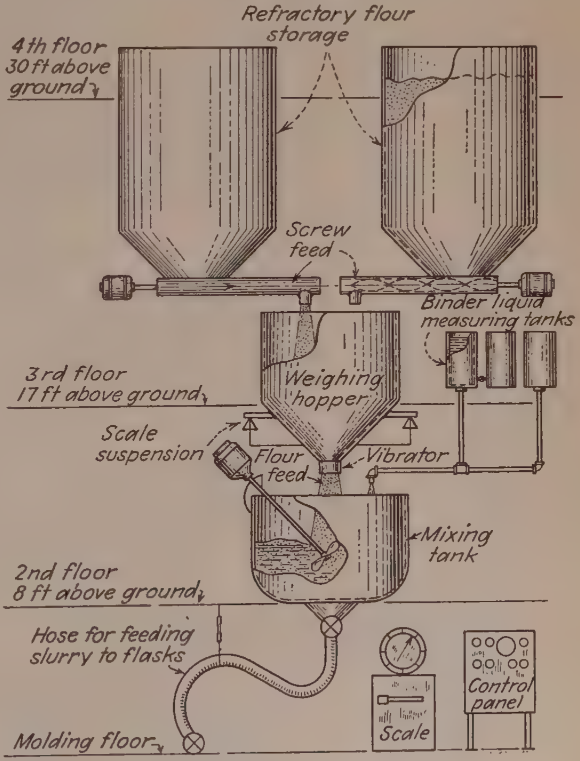
As trees are built up, they can be dropped in tote boxes without injury or can be set on the wax sprue plug which holds the tree (or an individual pattern) in suitable position for investing. Wax sprue plugs are short truncated cones molded without particular regard for precision.

Next, a hot soldering iron shaped the same as the base of a tree is pressed into the top of the plug leaving a recess of liquid wax into which the tree is set and held as the wax congeals. This operation is performed by molding press operators as soon as a tree is ready.

Investing the Molds

From this point onward, processing, though differing basically from that for sand casting, is comparable with it in many respects because it involves making molds of siliceous materials and, when the molds are ready, making castings in a parallel if not identical fashion. There is, however, the advantage of precision at least equal to that in other investment casting which in turn is generally better than in sand casting. Moreover, casting surfaces are much smoother

FIG. 5—Layout of the automatic slurry mixing unit at Midwest Foundry.


Refractory flour storage
4th floor 30 ft above ground
Screw feed
Binder liquid measuring tanks
3rd floor 17 ft above ground
Weighing hopper
Scale suspension
Flour feed
Vibrator
Mixing tank
2nd floor 8 ft above ground
Hose for feeding slurry to flasks
Molding floor
Scale
Control panel

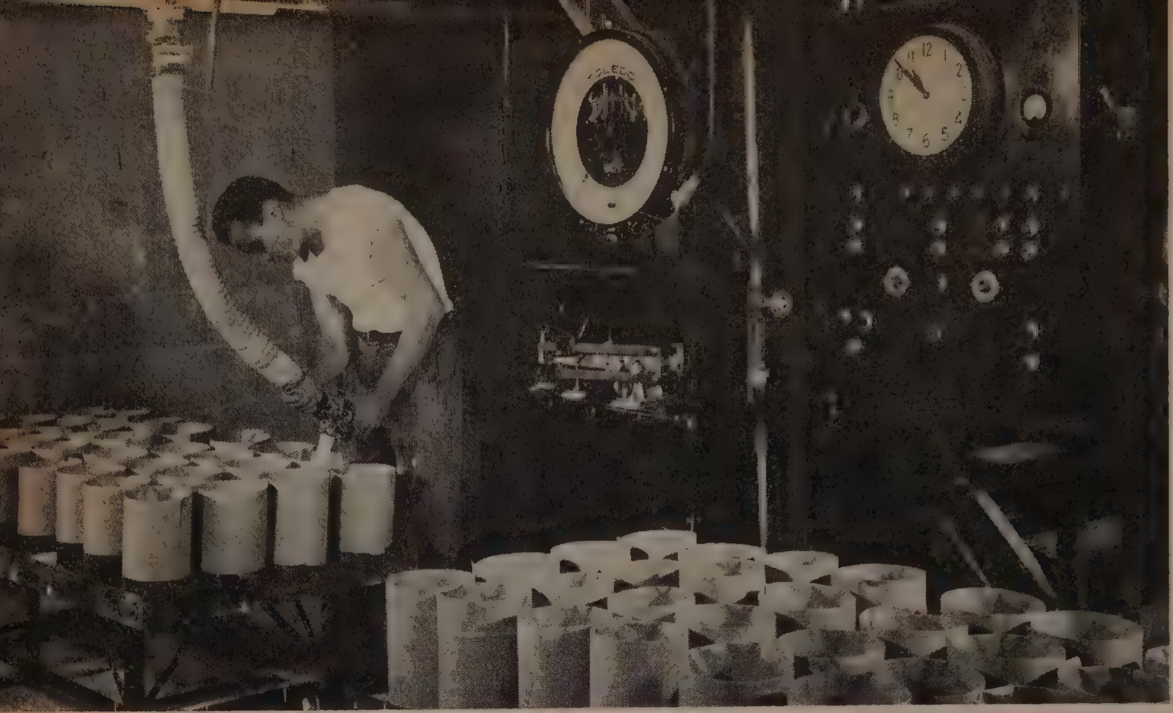


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FIG. 6—Filling flasks with slurry. Panel and scale for controlling the batch mixing operation are also shown.

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than for sand and equal to that for any casting method except for some nonferrous diecasting work.

The setup for investing, with the A.R.D. process, makes use of inexpensive binders and siliceous flours of varying finenesses. There is no dipping, spraying or powdering of patterns. Mechanization is such that one man, working alone, produces the slurry in large batches and fills flasks almost as rapidly as they can be delivered to the working area, at a total cost for materials and labor of about $14.00 a ton.

Due to this efficient but simple setup, and the equally simple procedures for processing molds and casting, it requires only four men to produce and cast about 400 molds per 8-hr day. These same men also charge and operate melting furnaces, repair linings as necessary and do all pouring and mold handling except for firing the molds, which is done by a night man working alone. It is significant that no great skill is required for any of the operations, hence little training of personnel is necessary. Actual making of the investment molds involve merely using

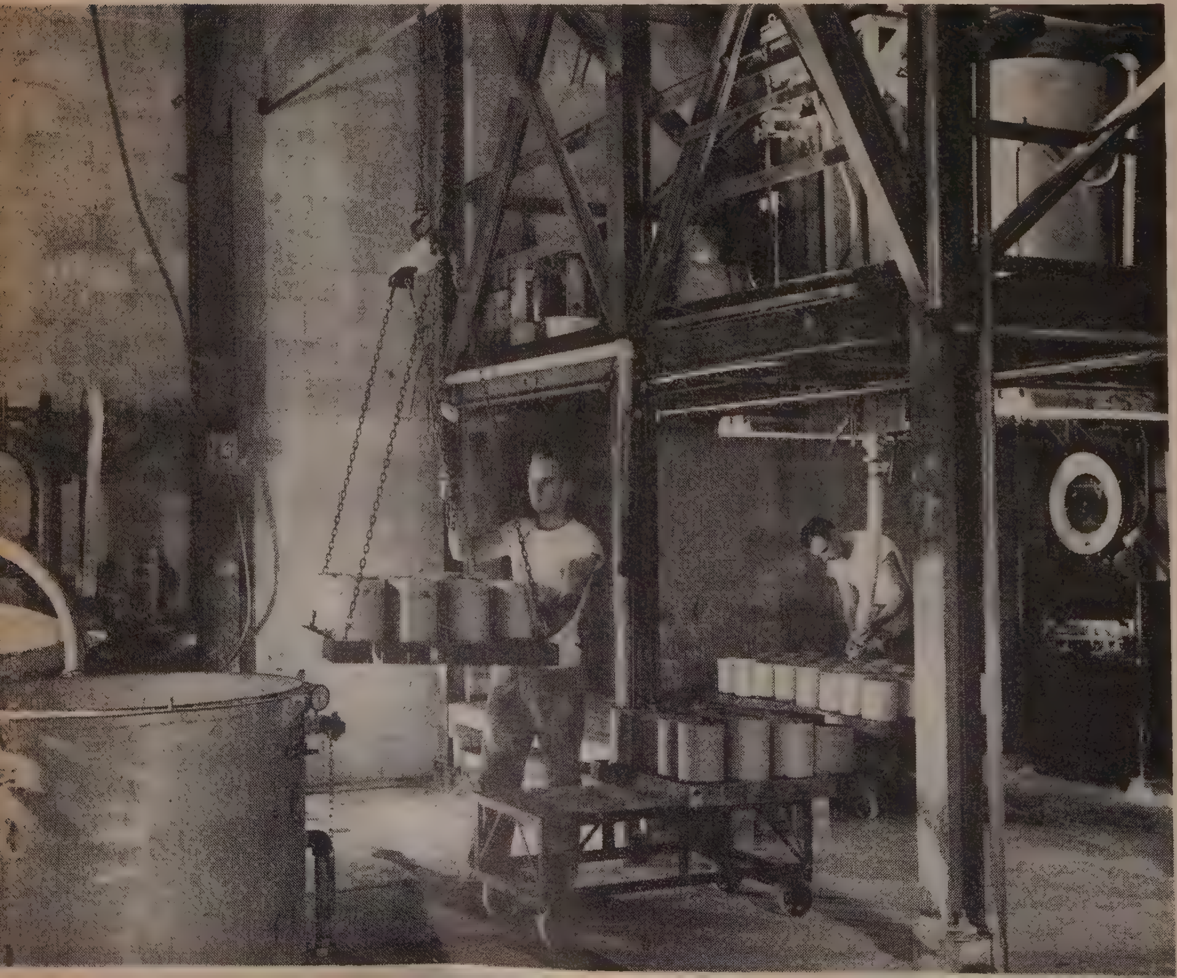

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FIG. 7—After flasks are filled by the operator shown in the background, they are placed in a vacuum tank (left foreground). The structural members supporting the slurry mixing unit (see fig. 5) are visible in this illustration.

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a hose to run the ready mixed slurry into the flasks (see fig. 6).

The layout shown in fig. 5 is employed to produce the slurry. This equipment consists largely of tanks, hoppers, screw conveyers and piping, all of it being supported in a steel framework and arranged so that the new materials at a high level are fed by gravity as needed until finally discharged through the hose for filling flasks. Operation of all valves and conveyers is controlled by pushbuttons from the panel shown in fig. 6.

There is a button to control the start of each phase of the cycle and a pilot light indicates when the phase is completed. It requires about an hour to prepare a 2000-lb batch of slurry, but during this period the operator can be filling molds from a prior batch or doing other work as the timing is automatic once a given setup of controls is made and any short delay in pressing buttons does not affect the results. Interlocks prevent departure from prescribed sequence. The size of a batch can be varied to suit the number of flasks to be filled but any surplus can be held without detriment or, if requirements are small, a batch for several days' work can be mixed.

As fig. 5 indicates, there are measuring tanks for each of the three liquid constituents that make up the binder and two hoppers for the two refractory flours that constitute the solids entering the slurry. Water from a main is the only other ingredient needed. The flours are fed simultaneously, first to a weigh hopper by screw conveyers, then to the mixing tanks by a vibrating feeder whose operation is indicated by a meter on the control panel. A rheostat is set to insure the proper rate of feed and is adjusted as needed if the meter reading indicates that a change in feed rate is required.

Liquids are fed to the mixing tanks (used alternately) in volumes measured in the small tanks provided for this purpose. After mixing of the liquids, the contents of the solids weigh tank is fed in slowly by a vibrating screen and is churned into the liquids by a mixer to produce the slurry. A typical schedule for a 2000-lb batch is as follows:

(1) Measure liquids and weigh out solids—5 min.

(2) Dump liquids into mixing tank and stir—1 min.

(3) Feed solids into mixing tank—15 min.

(4) Blend and pour slurry into flasks—30 to 40 min.

(5) Wash mixing tank and reset controls for next batch—2 min.

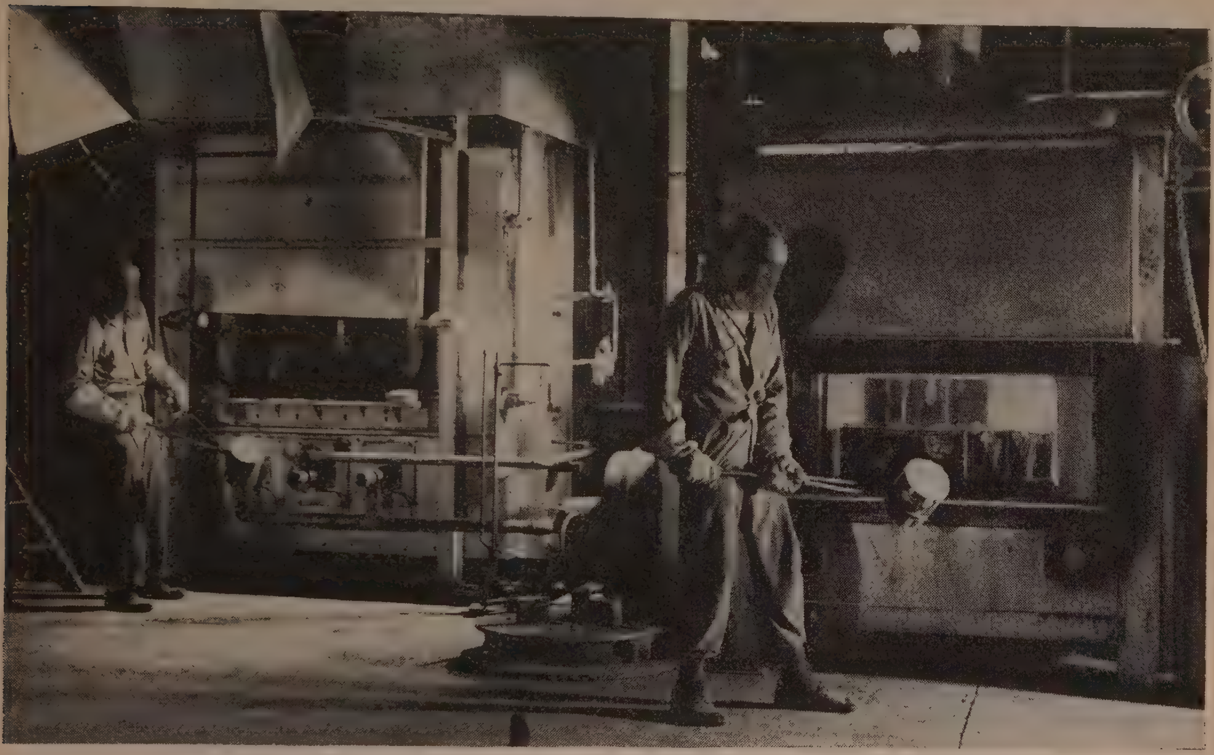


FIG. 8—Fired molds being transferred from furnaces to pouring floor.

Flasks are put in trays on castered dollies and pushed to the slurry feed hose as shown in figs. 6 and 7. Filling is done from a flexible hose leading from the bottom of the mixing tank.

When a tray of flasks is filled, it is lifted by chain hoist and placed in a vacuum tank, as shown in fig. 7. A 28-in. vacuum is applied for 3 to 5 min to remove air from the slurry. If this were not done the slurry would be porous and castings would be rough, as considerable air is churned into the slurry.

Upon removal from the vacuum tank, trays are placed in metal racks, and pushed into ovens where baking is done for 4 to 12 hr under a controlled temperature cycle. The temperature does not exceed 300°F and the time of bake depends upon the size of flasks. Ovens are electric

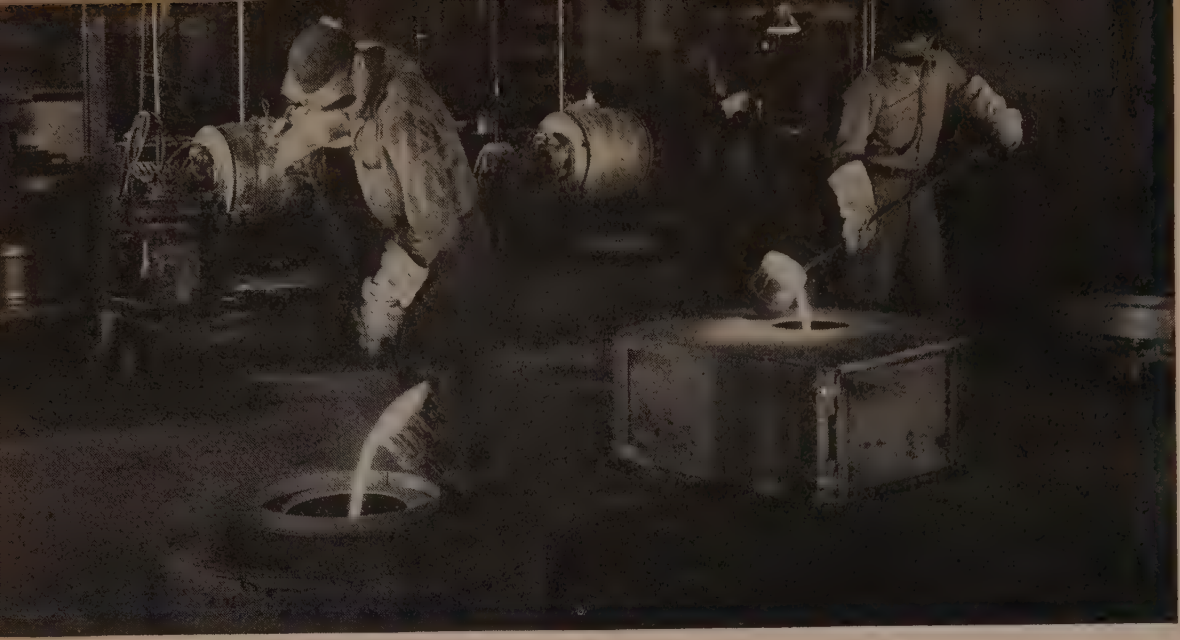


FIG. 9—Pouring molds after they have been positioned in centrifugal casting machines. Melting furnaces are visible in the background.

resistance heated and have an air circulating fan.

Under each of the grating trays that support the molds is a sheet metal tray that catches the wax from the sprue holes as the wax, melted by the heat, runs from the molds. The collected wax is used repeatedly for making new sprue plugs or occasional patterns for short-run work.

The temperature of this baking is not high enough to melt the plastic patterns and they remain in the molds until the latter are fired. Then the plastic runs out and is consumed in the furnace. Although the plastic could be recovered and reused, its cost is so low that recovery is not worth the trouble involved.

In baking, molds become dry and hard. Molds are not ready to be poured, however, until fired for 6 to 12 hr, the exact time depending on wall thicknesses. Firing is done at temperatures up to 1800°F in gas-fired furnaces during the night, the molds being set on mats and stacked several high. Pouring commonly is done with molds still hot.

Fig. 8 shows molds being transferred from firing furnaces to casting machines by the use of tongs. Mold temperature at pouring is not critical and pouring can be done, as a rule, at any temperature from that of the room upward but a low temperature is preferred for convenience and because castings cool more rapidly.

Once molds are ready for pouring, they can be set on the floor for gravity casting or can be cast centrifugally. The latter is preferred at Midwest Foundry and is used almost exclusively because it permits of a shorter sprue and requires no risers as are generally needed when gravity pouring. Thus, with centrifugal casting, the yield of castings from a given weight of melt is higher and this saving more than offsets the need for providing centrifugal machines. Spinning also minimizes defects due to porosity.

Machines for centrifugal pouring involve a chuck or table, rotating about a vertical axis inside a steel shell that rests on the floor. The chucks are of two types. For molds up to 8-in. diam there are recesses for four molds that are set with the mold and sprue axis radial and the sprue hole facing in. In the center of the table is a square pour block having a vertical hole at its center and four branch radial holes, one to each corner. These holes connect with the sprue holes of the respective molds.

Pouring, fig. 9, is done from hand ladles into the central hole of the block, all surfaces of which are given a fire clay wash. Pouring ceases as soon as the molds are filled but spinning continues until the metal solidifies. Molds are then removed and set aside to cool, making room for the next set.

Molds larger than 8-in. diam are made with cavities radiating from a central sprue hole whose axis is set vertical to that of the rotating table. In this case, no pour block is required, the metal being poured directly into the sprue hole and flowing from it radially to fill the mold cavities. The casting floor at Midwest is equipped with three centrifugal machines as shown in fig. 9.

All steel is melted in Detroit Electric furnaces (see fig. 9). It requires about 65 min to melt a 100-lb charge of metal.

Many stainless steels and other ferrous alloys as well as carbon steels are cast to customer specifications. A suggestion of the range in size and type of castings produced to date is given by fig. 1, which also gives an idea as to variations in thickness of sections. Castings can be made in weights ranging from a fraction of an ounce to 30 lb. Castings weigh six to seven times as much as the plastic pattern from which they are made.

Cleaning, testing and inspection procedures used at Midwest Foundry are comparable with usual precision casting shop techniques.

The author acknowledges the assistance of E. I. Valyi, A.R.D. Corp., and the management of Midwest Foundry Co. in the preparation of this article.

High Speed Induction Brazing With Interchangeable Fixtures

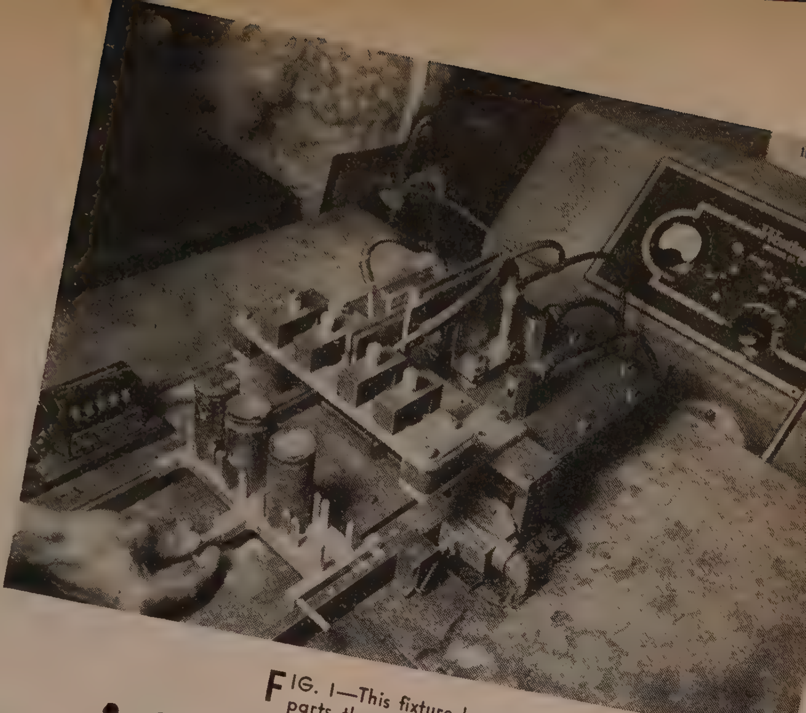


FIG. 1—This fixture brazes four dash pots simultaneously, parts that were formerly deep drawn. The part is now made from seamless tubing with a cap that is blanked and restruck to form the flange.

Versatility of a radio frequency induction generator, used in brazing parts for adding machines has been greatly increased by the development of four interchangeable fixtures. These four fixtures are used to braze or anneal 15 different parts, and brazing is clean, without distortion, and of high quality despite the use of unskilled help. The fixtures and their uses are described in this article.

By A. E. HEIDENREICH
Master Mechanic, Victor Adding Machine Co., Chicago
and
JOHN W. STEAD, JR.
Industrial Div., Westinghouse Electric Corp., Chicago

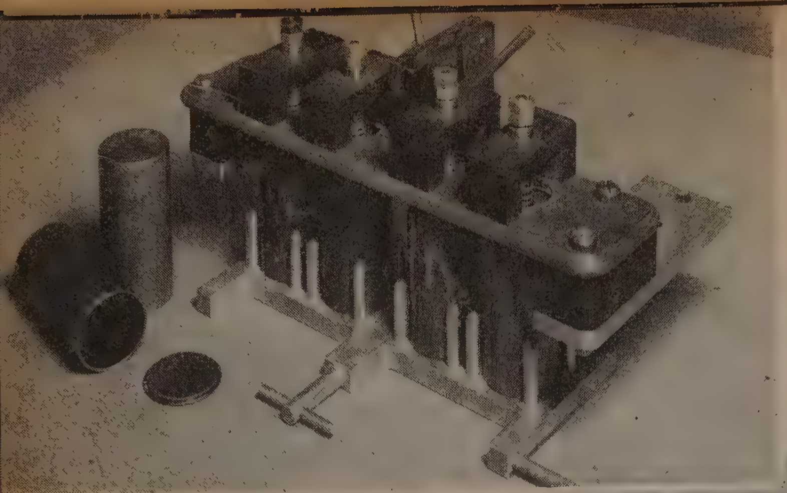
PRECISION tooling methods used in adding machine manufacture have been applied by the Victor Adding Machine Co., to induction heating. Four self-contained fixtures braze or anneal 15 different parts with the aid of one 5-kw Westinghouse radio frequency induction generator.

The induction heating process has permitted simplification of assemblies, reduction in the number of operations, and elimination of detailed inspection. Brazing operations are cleaner and without distortion, and localized heating is used to advantage in brazing without annealing hardened areas. In addition, high output of good quality is possible with unskilled women operators.

The principal parts handled by the four fixtures are cam and crank arms, dash pots, and shafts. The crank arms and dash pots are brazed while the shafts are selectively annealed.

The setup consists of a general purpose fixture built into a wooden table with a Transite top as shown in fig. 1. On the table is a radio frequency current transformer for concentrating the heat in small areas, a platen directly under the brazing fixture itself, a microswitch to the right of the brazing fixture, a Veeder counter, and two slide rails. Below the table is an air cylinder to move the platen up and down. The microswitch operates the platen and turns on the generator. On the platen are two locating pins.

The particular fixture shown is for brazing the dash pot assembly. A closeup of the fixture itself is shown in fig. 2. As can be seen in fig. 1, the lower locating block of the brazing fixture rides the two slide rails on the table. The finger trips the microswitch when this block is pushed into place under the upper inductor block. The air cylinder pushes the platen and lower block up so that the dash pot caps are pressed against

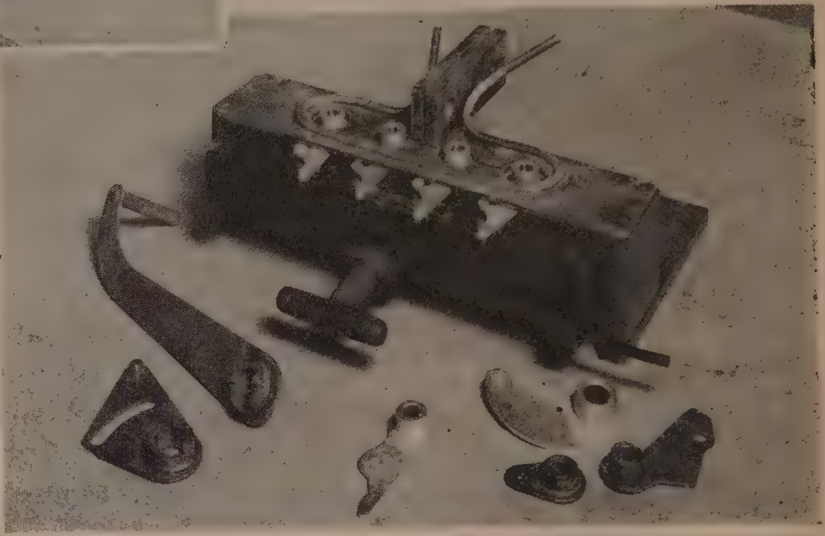


BELOW

FIG. 3—This cam and crank arm brazing fixture accommodates the six assemblies shown with it. Pins on the locating block precisely position the bushings in relation to the plate to which they are brazed.

ABOVE

FIG. 2—The dash pot fixture is shown here in detail. In this fixture, the parts are loaded, the holding unit is slid under the coils on rails, and a microswitch is tripped to bring the platen and lower block up so the caps of the parts press against the springs in the upper block.



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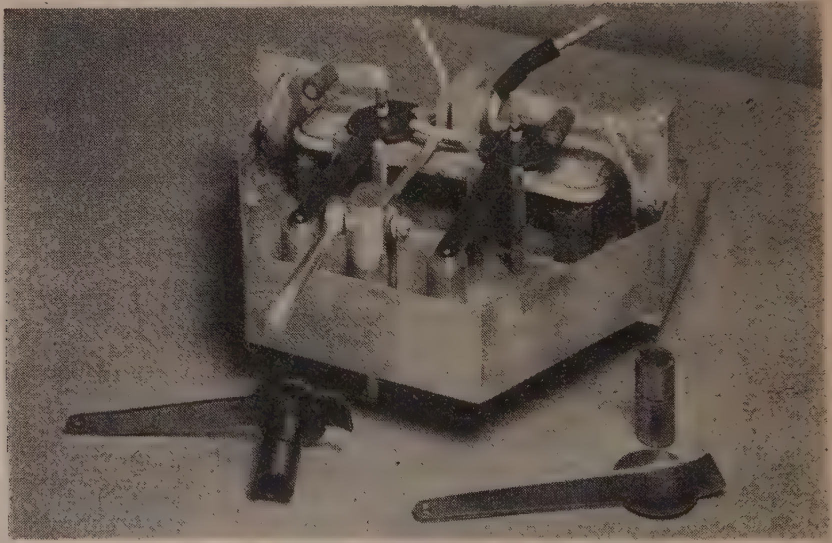
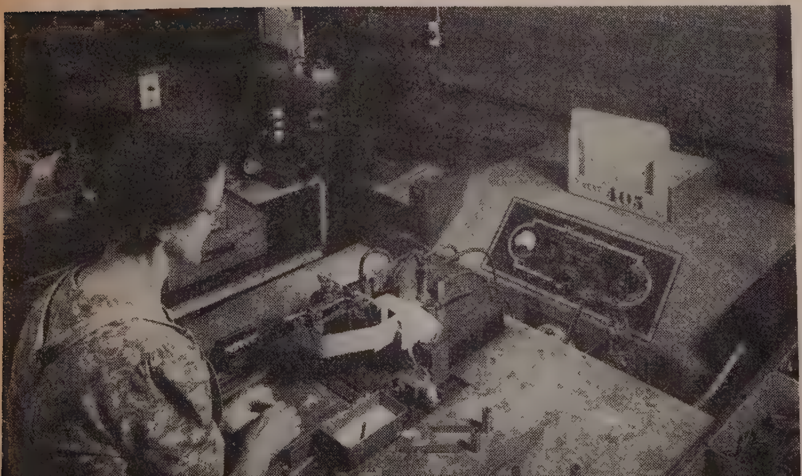


BELOW

FIG. 5—The fixture shown in fig. 4 is shown here in operation. The heating cycle is automatically timed, and production is about 200 parts per hr.



ABOVE

FIG. 4—No separate lower locating block is used in this fixture and the tub contains water to keep cool the hardened keys of the part. The fixture is hand loaded by lifting the two arms out of the way by the small wooden handles.

the springs in the upper block. Simultaneously, the microswitch starts the heating cycle, which is controlled by an automatic timer on the generator.

The dash pot assembly, detailed in fig. 2, was formerly deep drawn. Now with induction brazing, it is made from seamless tubing. The cap is blanked and restruck to form the flange. As with the other parts to be described, these parts are pre-fluxed and brazing-alloy rings are used. Better results are obtained when the flux is thoroughly dried before brazing.

The brazed assembly is made at approximately 20 pct of the cost of the deep drawn dash pot. Production rate is 200 parts per hr, brazing four simultaneously. Although it is possible to braze 13 parts at once on the 5-kw generator, convenience in handling gives the best production with four parts.

The inductor-block type, induction heating coil used in all four of the fixtures can be best seen in the photo of the fixture used for brazing crank arms and cam assemblies, fig. 3. The inductor block is made of ¼-in. copper bar stock. The vertical members are connected to the inductor blocks of the current transformer, as seen in fig. 1, by screws put through the hole for the purpose. These screws are not shown in place in fig. 1.

The copper tube shown in fig. 3 is for cooling water. It will be noted that the cooling water tubes in the other fixtures run under the inductor block.

The fixture shown in fig. 3 is for brazing bushings on the cam assemblies and crank arms. Six typical assemblies are shown along with the fixture. In general, this fixture is loaded in the same way as the dash pot fixture. The necessarily exact location of bushings with respect to the plate in these parts is accomplished by means of pins on the locating block that extend up through the plates and bushings. Four parts are brazed simultaneously and the production rate is 160 parts per hr. In the inductor block, the holes are enlarged to equalize the heating rates.

The crank arm assemblies shown in fig. 4 present the problem of brazing the hollow shaft to the arm without annealing the hardened key on the end of the shaft. This is accomplished in the *bath tub* fixture shown in figs. 4 and 5. The fixture differs from those described in that, as shown in fig. 5, there is no separate lower locating block; and the tub is partially filled with water to keep the hardened keys cool. The fixture is hand-loaded by lifting the two holding arms out of the way by the small wooden handles and placing the parts to be brazed on the locating pins. The cycle is then started manually. At the end of the automatically timed heating cycle, the hand valve at the front of the fixture is opened to spray a jet of cooling water onto the heated area. The production rate is 200 parts per hr.

This assembly was previously made from three parts. The arm, consisting of a straight piece and a circular washer, was torch brazed. To this the hollow shaft was joined, again by torch brazing. A considerable saving was made possible by the elimination of the separate washer in the induction heating method.

The fourth fixture used by the Victor Adding Machine Co. is shown in fig. 6. Hardened shafts fastened to arms at three points with taper pins are used in the adding machine. It is necessary that the areas at the taper pins be soft. The induction heating fixture shown permits selective annealing of the shafts. Hardened shafts, resting on the guides, are pushed through the inductor coils to the hand stop at the left. After the heating cycle, the hand stop is depressed and another hardened rod is inserted pushing the finished piece out at the left. Two different shafts are handled on the one fixture by adjusting the coils. Production rate is about 800 pieces per hr.

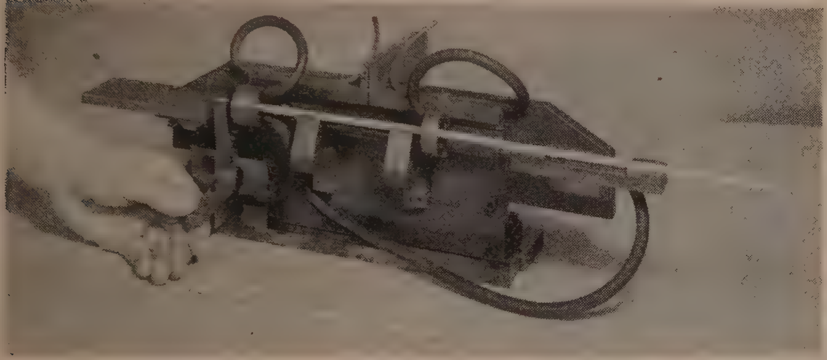


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FIG. 6—This fixture permits selective annealing of the shafts at three points, two at the coil position on the left and one at the coil position on the right. Production is 800 parts an hr, and parts are fed in at the right and out at the left, being positioned by the hand stop.

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The inductor coil at the left anneals two adjacent areas and the coil on the right the third area. Prior to the use of induction heating the shafts were either locally copper plated or painted before carburizing. This method necessitated 100 pct inspection, and even so, a number of drills were broken in making the taper pin holes.

The outstanding feature of the four fixtures is their easy interchangeability. All are quickly bolted to the mounting bridge over the front of the current transformer on the table and connected directly to the inductor coil of the transformer. Cooling water connections are made with rubber tubing. The entire changeover can be made in 10 min.

Electroplating Recessed Areas

Parts requiring the plating of recesses or the deposition of an extra heavy plate on a specified area are a major problem for many plating shops. This article describes the use of dipolar electrodes, which use stray bath current and have no direct connection to either electrode, to solve such problems.

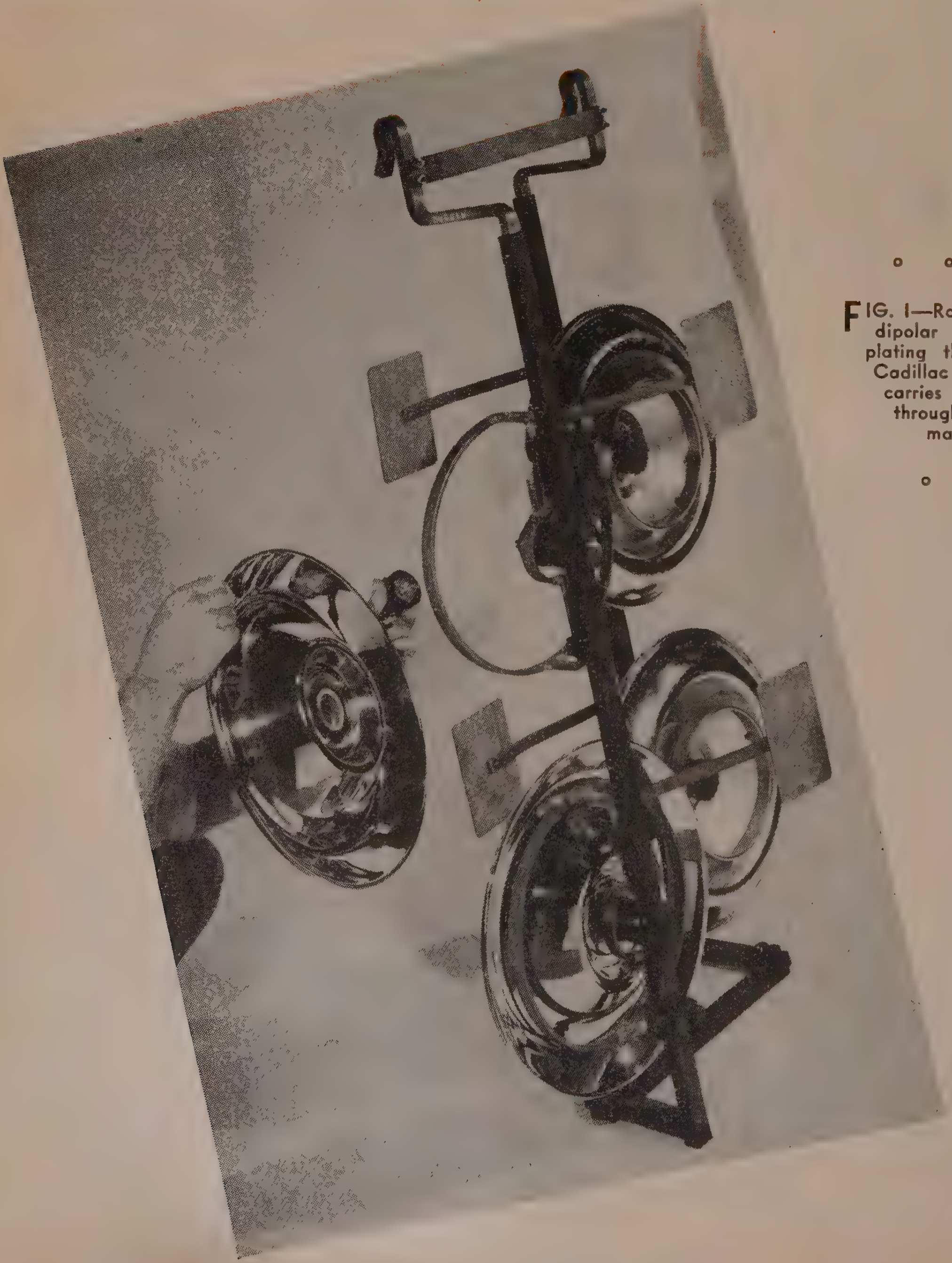

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FIG. 1—Rack, rigged with dipolar electrodes for plating the recesses in Cadillac wheel disks, carries four disks through a fully automatic machine.

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With Dipolar Electrodes

By UYVAL C. JONES

Service Engineer,
Duggan Masking Devices,
Detroit

RECESSES or angles in parts to be electroplated have been a major problem for as long as electrodeposition has been practiced, and the development of automatic techniques has accentuated difficulties in many instances by necessitating additional anode rails, rack contacts or contact fingers all of which often prove costly or clumsy or both.

Frequently such problems can be economically solved by the use of dipolar or auxiliary electrodes having no direct electric connection with either the cathode or anode of the bath. Such electrodes pick up stray current and by affording a path of lesser resistance can be utilized to throw the specified plate thickness to the recessed area without wasteful heavy plating on the forward sections.

Interesting recent applications are in the line of Cadillac Motor Car Co., Detroit, where the method is applied to the plating of wheel disks having a deep recess, and for bumpers, which in the 1949 model have a considerable curvature. For the wheel disks, which require a full 0.002 in. plate even in the deepest part of the recess, Cadillac uses the rack shown in fig. 1. On these racks, made by Duggan Masking Devices, Detroit, four wheel disks are taken through a fully automatic machine. The dipolar auxiliaries are made separately and are bolted to molded neoprene clamps fastened over the molded insulation of the rack. If a dip type coating is used, micarta or some other insulating material is required to prevent contact.

For the disks a positive auxiliary anode could be used in chrome, but in nickel a very rough deposit would have resulted in the recess, and to have plated the recess to specification without auxiliary anodes would have given the areas nearest the anode an excessively heavy and rough plate.

The principle of the dipolar electrode is to provide a shortcut for current in the bath and to lead it into the recessed area where that end of the electrode, being near the cathode, becomes an induced anode and throws metal to the part being plated. Fig. 2 shows the principle involved. The collecting plate or target adjacent to the anode becomes an induced cathode and is plated upon. The other end of the dipolar electrode is positioned for optimum plating of the recess and becomes an induced anode.

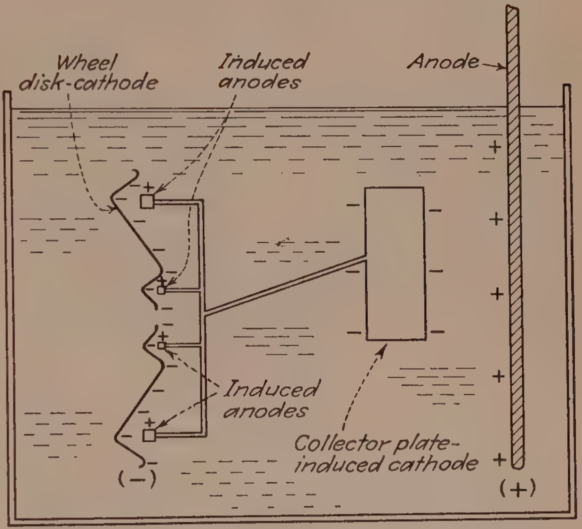


FIG. 2—Diagram shows the principle of the dipolar electrode. Insulated from both anode and cathode, the collector plate becomes an induced cathode, and similarly the rings, positioned in the recesses of the wheel disk, become induced anodes throwing metal into the recess.

Current, rather than going through the solution, is drawn to the collector plate, flows down the metal conductor to the induced anode, shaped to conform to the recess. The size of the collector plate and its proximity to the anode determine the metal distribution on the part. In turn, resistance of the solution, current density, distance of the plate from the anode and other factors determine the size of the collector plate.

The principle is in operation when plating on tank walls occurs. If uninsulated steel tanks are used in zinc, silver or cyanide copper plating, and the distances of the racked work from the anode are not correct, metal is deposited on the anode are not correct, metal is deposited on the tank wall and the tank near the work acts as an induced anode. Or, in other processes when there is a break in the tank lining, a similar phenomenon occurs, and burned or otherwise defective work as well as metal depletion from the bath result.

Corrosion Resistant Materials in Brass and Copper Pickling

SELECTION of corrosion resistant materials for use in sulfuric acid solutions pickling brass and copper is determined by the particular concentration being used, and by the degree of agitation, temperature of the bath and other factors involved.

It is possible to predict performance with some accuracy using the test data in tables I and II, assembled for a technical bulletin of the International Nickel Co., Inc., New York.

Brass and copper pickling solutions vary somewhat more in acid concentration than do steel pickling baths, and depend largely on the thickness of the oxide film or scale to be removed. Concentrations may range from 5 to 20 pct H_2SO_4 and temperature may be from room temperature to 180°F. During pickling the acid dissolves copper from the product and gradually builds up a copper sulfate content. Where ordinary immersion pickling is used and no oxidizing agents are added to the solution, the copper sulfate is usually in the cuprous form and the solution will remain reducing in nature due to hydrogen generation.

Under such conditions, experience has proved Monel baskets and crates to be satisfactory for handling brass parts. Table I shows the results of corrosion tests for a number of metals and alloys in these operations.

Some plants use the same baskets or crates for carrying brass parts through both annealing and pickling cycles. For such combined operations, Monel is not recommended as at annealing temperature, 1100° to 1200°F, Monel may be subject to intergranular sulfur attack originating from acid adhering to the crates after pickling. Inconel gives more satisfactory performance as it is resistant to sulfur attack and to embrittlement at annealing temperatures.

Where small brass parts are pickled in continuous, conveyer type spray machines, the acid be-

TABLE I

Plant Corrosion Tests in Pickling of Brass and Copper

Test 1: Immersed near center side of pickling tank in 5 pct sulfuric acid plus 0.5 oz per gal of copper as copper sulfate. Solution heated and agitated with live steam. Temperature 175° to 185°F. Duration of test 30 days.

Test 2: Immersed in pickling tank in 19 to 28 pct sulfuric acid plus 2 to 4 pct copper sulfate, during flash pickling of brass parts. Temperature 140°F. Duration of test 41 days.

Test 3: Immersed in pickling tank during continuous pickling of oxidized copper sheet in 20 pct sulfuric acid plus up to 5 pct copper sulfate. Tank drained and refilled four times during test. Temperature 140° to 160°F. Duration of test 25 days.

Test 4: Exposed in spray pickling machine to spray of 10 pct sulfuric acid plus 2 pct copper sulfate. Aerated by spraying. Temperature 90°F. Duration of test 176 hours.

Material	Corrosion Rate, in. per yr.			
	Test 1	Test 2	Test 3	Test 4
Monel	0.036	0.005	0.024	0.090
Nickel	x		0.052 b	0.086
Inconel	0.055	0.046	0.086	0.0001
Worthite	0.0003		0.002	0.0001
Durimet 20	0.0005		0.006	
Hastelloy B	0.074 a			
Hastelloy C	0.002	0.002		
Hastelloy D		0.070		0.072
Ni-Resist (Type 1)				0.62
Mild Steel				y
Cast Iron				1.54
Chemical Lead			0.005	0.003
18-8 Mo Stainless (Type 316)	0.0001	0.0001	0.014	0.0001

a—Perforated by localized corrosion. Original thickness of specimens 0.037 in.

b—Pitted to maximum depth of 0.009 in. during test.

x—Completely corroded away before end of test. Original thickness of specimens 0.031 in.

y—Completely corroded away before end of test. Original thickness of specimens 0.062 in.

TABLE II

Plant Corrosion Tests in Bright Pickling of Brass

Test 1: Immersed 6 to 12 in. below minimum liquid level in pickling tank during pickling of brass in 7 to 8 pct sulfuric acid plus 0.8 to 0.9 oz per gal of sodium nitrate. Solution agitated with plunger. Temperature 155° to 165°F. Duration of test 13 days.

Test 2: Immersed in pickling tank during pickling of brass in 23 pct sulfuric acid and 18 pct nitric acid. Temperature 150° to 180°F. Duration of test 31 days.

Test 3: Immersed near center side of pickling tank during bright dipping of brass in 5 pct sulfuric acid plus 1.1 oz per gal of sodium bichromate. Temperature 70° to 85°F. Duration of test 30 days.

Test 4: Immersed near center side of pickling tank during pickling of brass in 10 pct ferric sulfate solution plus 0.5 pct citric acid. Solution heated and agitated with live steam. Temperature 170° to 210°F. Duration of test 38 days.

Material	Corrosion Rate, in. per yr.			
	Test 1	Test 2	Test 3	Test
Monel	0.37		x	x
Nickel	x		0.0002 a	0.043 c
Inconel	x	0.0005	0.0004 b	0.0004 a
Worthite			0.0001	0.0001
Durimet 20			0.0001	0.0001
Aloyco 20		0.0001		
Durimet T	0.0001			
Hastelloy B			y	y
Hastelloy C	0.002	0.0002	0.0001	0.0005
Illium R		0.0001		
Chemical Lead	0.052			
18-8 MoStainless (Type 316)	0.0001		0.0001 d	0.0001 d

a—Pitted to maximum depth of 0.010 in. in crevice under insulating spacer.

b—Perforated by pitting in crevice under insulating spacer. Original thickness 0.031 in.

c—Perforated by pitting on free surface and in crevice. Original thickness 0.031 in.

d—Perforated by pitting under insulating spacer. Original thickness 0.031 in.

x—Completely corroded away before end of test. Original thickness of specimens 0.031 in.

y—Completely corroded away before end of test. Original thickness of specimens 0.037 in.

comes highly aerated and some of the copper content is converted to cupric form. Under these conditions, as shown in test 4 of table I, the corrosion rate of Monel is usually too high for economical use. Inconel, on the other hand, is resistant to such oxidizing conditions if the acid temperature is not high and may often be used for baskets and for conveyer rolls and other structural parts. Nickel-chromium-molybdenum-iron alloys, such as Worthite and Durimets, often are used in the construction of these machines and for rotating-drum pickling units.

In flash or bright pickling of brass parts, oxidizing salts such as dichromates or nitrates or nitric acid may be added to the sulfuric acid solutions. Results of plant corrosion tests with several such baths are given in table II.

Under these highly oxidizing conditions, Monel and nickel are subject to rapid attack. Inconel and other nickel-chromium alloys are frequently used for dipping baskets, and the nickel-chromium-molybdenum-iron alloys usually are resistant and can be used for pumps, valves and other parts. Type 316 stainless steel tanks are sometimes used under such conditions, although the alloy may be subject to localized corrosion if the tank design permits crevices where oxidizing conditions cannot penetrate.

Automatic Furnace for Soldering Diesel-Electric Commutators

SERVICING of increasing numbers of diesel-electric locomotives has found hand soldering for the repair of commutators to be impractical. The length of time involved and the inconsistent results obtained make it desirable that an automatic furnace be used.

Successfully soldering of 18 in. diam commutators in an automatic-type installation is accomplished by the Atchison, Topeka & Santa Fe Railroad at their San Bernardino Yards in slightly less than 2 min. Using the old method it took one man about 8 hr to solder the connections by hand. The new soldering machine, shown in the accompanying illustration, installed last year, consists of two specially designed melting furnaces mounted on a level foundation. An annular, automatic temperature controlled, cast alloy ring supported on a steel frame is mounted directly between the melting furnaces. This ring is of a diameter slightly greater than that of the commutator to provide the necessary clearance. Plungers in the two melting furnaces force molten solder into the center ring to effect a complete solder.

Adapter rings are available which can be inserted within the annular ring to allow the soldering machine to be used for various size commutators.

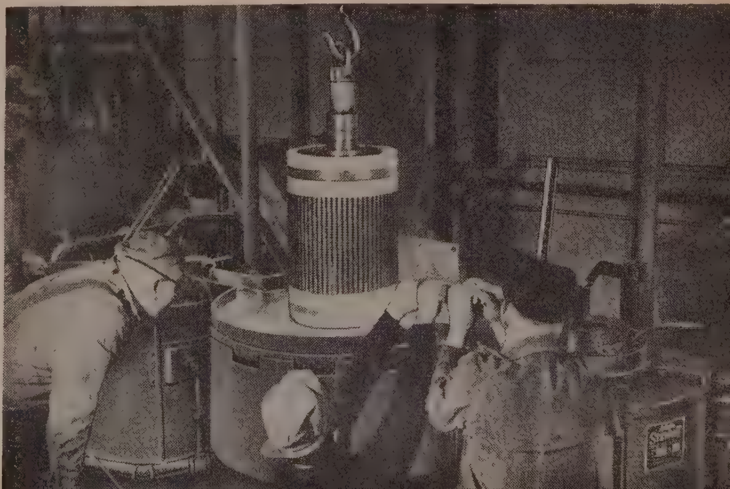
Four factors that govern an even soldering throughout the commutator's circumference are the following: (1) Pre-heat temperature of the commutator; (2) temperature of solder during cycle; (3) soldering time, and (4) volume of solder in contact with commutator. It is essential that all these requirements be met to ensure consistent high quality results. With the new unit the latter three variables are automatically controlled. This automatic double pot soldering furnace was developed by the Sunbeam Stewart Industrial Furnace Div., of Sunbeam Corp., Chicago.

At Santa Fe automatic temperature control equipment holds solder at 720°F in both melting furnaces and center ring. A commutator is first pre-heated from 3 to 12 hr at 300°F. It is then placed, by an overhead crane, in a perpendicular position in the annular ring with the commutator end at the bottom. With the commutator in position, plungers force solder into the ring. Proper sealing of the slots takes place within 2 min. An asbestos ring around the bottom of the commutator forms a seal between the commutator and adapter. Plungers are then released, causing the solder to return to the melting furnaces.

The flow of solder evenly and quickly to the desired soldering level is accomplished by means of a groove in the annular ring. Solder flows into the groove, then overflows evenly toward the commutator without splashing. Baffles prevent a direct flow of solder to the commutator. This assures the entire circumference of the commutator receiving the solder at the same moment.

Sufficient volume of solder is provided in the unit and kept at the desired soldering temperature to prevent chilling when it comes into contact with the commutator which has been preheated to a lower temperature.

SOLDERING a commutator for a diesel-electric locomotive at Santa Fe's San Bernardino, Calif., Yards. Two men on each melting furnace force solder into the center ring, by means of plungers, after the armature has been placed in a special adapter ring. The operation is completed in approximately 2 min.



AISE MEETING . . .

Williams to

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C. H. Williams, chief engineer, Carnegie-Illinois Steel Corp., Pittsburgh, has been elected to serve as president of AISE for 1949.

C-I's C. H. Williams elected 1949 president of AISE at annual convention in Cleveland . . . Fisher wins Kelly award . . . 200 exhibitors display new developments in supplies and equipment.

A VARIED program of technical meetings and social sessions, combined with an extensive exhibition of the newest developments in equipment and supplies, greeted the 12,000 steel plant executives and engineers attending the annual convention of the Assn. of Iron and Steel Engineers in Cleveland last week.

C. H. Williams, chief engineer, Carnegie-Illinois Steel Corp., Pittsburgh, was elected president of the association for 1949 at the annual meeting of the steel mill group. Mr. Williams served as first vice-president of AISE in 1948, and will succeed A. J. Fisher, assistant chief engineer, Bethlehem Steel Co. A. S. Glossbrenner, AISE second vice-president for 1948, was elected to serve as first vice-president for 1949. Mr. Glossbrenner is assistant vice-president of operations, Youngstown District, Youngstown Sheet & Tube Co.

One of the highlights of the annual meeting, the announcement of the Kelly award winners for outstanding technical papers, this year saw the first prize being awarded to A. J. Fisher, assistant chief engineer of Construction, Bethlehem Steel Co., for the paper "Recent Improvements in Cover Annealing" published in the April, 1947, issue of *Iron and Steel Engineer.* Mr. Fisher will retire this year as AISE president.

Second place winner in the Kelly award competition was E. T. W. Bailey with the paper "Oxygen Accelerated Combustion in Open Hearth Furnaces," while Ross E. Beynon was third place winner with the paper "Rod Mills and Rod Mill Design."

The large exhibition of equipment and supplies, with some 200 companies participating, appeared to place particular emphasis upon means of obtaining more precise control of operations at the higher speeds encountered today; emphasis was also placed upon methods to be used to reduce worker fatigue.

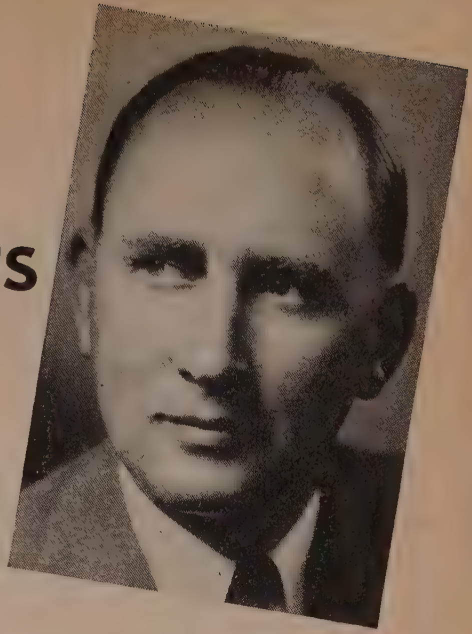
The technical sessions covered a wide range of subjects, from human relations and the machine tool industry's needs from the steel industry to temperature measurement, rolling strip at 70 mph and the effect of oxygen on refractories. Reports of progress being made on several research programs sponsored by the association were also made.

The need for placing greater emphasis on the human factor in industry and less on increased technical developments was stressed by John E. Goble, president, National Tube Co., as a possible solution to industrial strife. Mr. Goble, who spoke at the annual dinner of the Association, stressed that "our machines and knowledge of them have improved, and our use of them has become more and more difficult, but the most important job still faces each and every one of us—the development of our human relationships so that the working arrangement between human beings will keep pace with the physical developments of the machine age."

Tell Berna, general manager, National Machine Tool Builders Assn., told the engineers "What the Machine Tool Industry Wants from the Steel Industry." Emphasizing the importance of the industry to the machine tool builders, Mr. Berna interpreted some of the current problems of industry in the light of the problems faced and being faced by industry in Britain and other European nations. Mr. Berna, who recently returned from an extensive trip aboard, urged that renewed emphasis be placed on the proper understanding of the functioning of the American enterprise system and, in turn, the human problems which must be solved to insure the proper functioning of this system.

In a paper, presented at one of the technical sessions, entitled "Effect of Oxygen on Refractories in the Basic Openhearth," R. S. Moore of the Harbison-Walker Refractories Co., discussed various relationships between certain causes and

Head Steel Engineers



A. J. Fisher, assistant chief engineer of construction, Bethlehem Steel Co., winner of the Kelly award for 1947. Mr. Fisher is president of AISE.

effects surrounding the use of oxygen. He observed that the manufacturer of refractories is fully aware that the use of oxygen creates new problems in the application of his product, but since these problems seem to be a long way from final definition, his program of research and development work must be directed toward paralleling that of the basic openhearth operator.

Use of a superduty silica brick, containing not more than 0.5 pct of total fluxes, was suggested, based on the fact that this type refractory can withstand higher temperatures and its lower content of liquid at service temperature is known to make it more resistant to reaction and fluxing by iron oxide and other basic fluxes. The speaker said that in one openhearth shop, using approximately 300 cu ft of oxygen per gal tar at the burner during the meltdown with a resulting increase of 12 pct in tons per hr and decrease of 20 pct in fuel consumption, a single super-duty silica brick roof has come within about 3 pct of matching the shop average for conventional silica roofs on furnaces operated without benefit of oxygen.

Basic refractories would appear to be the solution, but as Moore pointed out, even though the refractoriness of basic brick is well above present or contemplated openhearth temperatures and basic brick is inherently very resistant to the fluxing action of basic slags and possesses excellent resistance to load, the thermal expansion characteristics of basic brick are such that the simple substitution of basic brick for silica brick is not possible.

Referring to other uses of basic brick in the openhearth, the speaker indicated that currently there are more than 30 openhearth furnaces in which basic brick is used throughout the port walls and in suspended arches over the ports. There are also two furnaces operating with basic main roofs in addition to having basic slag pockets. Most shops which have worked with oxygen use basic brick as a matter of course in front walls, in back walls if any, and in end wall bulkheads. The effect of oxygen on front walls and back walls is difficult to evaluate since they are subject to mechanical hazards and other variables entirely unrelated to the effects of oxygen and are always replaced at the end of a main roof campaign even though they might have served for a somewhat longer interval. It must be recognized that an increased rate of roof consumption must have an adverse effect upon basic front walls and back walls as the result of the increased rate at which silica from the roof runs down over them.

Moore indicated that in the opinion of the majority of operators who have had experience with oxygen, its effect on basic end wall bulkheads is not particularly significant. There remains to be evaluated the effect of the use of oxygen upon checkers and regenerator chambers. Higher regenerator temperatures may or may not be a necessary corollary when sufficient experience has taught the optimum time interval between reversals.

Acknowledging the difficulty in controlling the heating rate of continuous pusher type heating furnaces, F. S. Bloom, Bloom Engineering Co., Inc., delivered a paper in which he discussed "Steel Temperature Measurement and Control of Billet Heating Furnaces." The rate of heating varies over wide limits from an instantaneous peak demand to a standby delay, he said, and to expect a heater to control a furnace, and in many cases, three of four furnaces consistently to an even product temperature is demanding more than a human machine can produce. Operating records of steel temperature indicate that with manual control the steel temperature, half way through a continuous furnace, very often varies as much as 300°F from a too hot condition to being too cold.

Considerable interest was expressed by those in attendance in Bloom's description of various types of furnace designs, which embraced different methods for heating the steel products and different techniques for obtaining temperature measurements. He revealed that 90 pct of the furnace maintenance troubles occur during periods of mill delay when an excess of fuel is used to a detriment of the furnace operation. All furnace operation should be designed to keep a heat pattern as close as possible within very close limits. Any change from the standard heat pattern of the furnace will cause difficulty in either maintenance or furnace operation.

Based on the experiences outlined in his presentation, Bloom arrived at the following conclusions:

(1) The continuous billet-heating furnace can be controlled by a steel temperature measuring controller.

(2) Steel temperature measurement and control can eliminate at least 75 pct of the vigilance required of an experienced heater.

(3) Steel temperature measurement and control can eliminate at least 75 pct of the slag conditions and scale buildup on the hearth of the conventional furnaces.

(4) Steel temperature measurement can increase furnace production at least 10 pct without additional changes.

(5) Steel temperature measurement has indicated the value which has always been assumed to be in the use of correct air:fuel ratio and proper furnace pressure. It is possible to demonstrate the fuel saving which can be attributed to these two automatic machines. The steel temperature reading will quickly indicate any change in furnace pressure or in fuel:air ratio. It is easy to set these controls at their proper value by watching the temperature record and thus obtain maximum furnace efficiency.

Refractory problems encountered in maintaining bottoms in various types of reheating furnaces and soaking pits typical of a steel plant were discussed by C. N. Jewart, ceramic engineer, Lackawanna Plant, Bethlehem Steel Co., in his paper "The Maintenance of Hearths in Heating Furnaces and Soaking Pits." The types of furnaces included batch type regenerative; and single, double and triple fired continuous with recuperators; the soaking pits included reversing regenerative and one-way fired with recuperators.

A typical installation is characterized by two furnaces used for reheating blooms for a 32-in. rail mill. The blooms are pushed into the furnace mechanically from a moveable table. They remain in the furnace approximately ½ hr and are then withdrawn from the opposite side by a grabbing mechanism which pulls them out onto another moving table and transfers them to the mill roller line for rolling into rails.

Dragging the bloom across the hearth subjects it to considerable abrasion. The hearth is composed of a series of troughs, large enough to take a single bloom. In the past, these troughs were made up of first-quality brick with approximately 3 in. of ground ganister rock put in as a bed. This ganister absorbs some of the scale and after a time, a liquid forms at the bottom, composed of iron and silica which adheres to the bottom of the bloom and causes markings in the finished product. Due to the periodic operation of this furnace, there are times when the liquid formed solidifies, and additional scale causes a buildup At other times the temperature is such as to cause the bloom to wear down the bottom of the trough.

In the case of the buildup, it is necessary to spray the hearth with water to chill the scale for easy removal. Some of the ganister comes out with the scale which makes it necessary to bring up the level of the bottom by adding more ganister. If too much liquid is formed and the bottom begins to wear down, ganister is added to dry the bottom as well as to buildup the level.

At the present time one of the furnaces has been rebuilt with a basic brick bottom. This bottom has 11 different combinations of basic refractories which include high magnesite, hard-fired magnesite, chrome magnesite, chrome, silicon carbide, fused Al_2O_3 and plastic chrome ore. This bottom has been in operation since May, 1948, and it is too early to give any information regarding the combination that will give the most satisfactory results. The troughs are subject to a buildup of scale, but so far no liquid fluxes have developed to mark the finished product.

Trend Still From Oil To Coal

The years from 1935 to 1941 were truly the fuel oil period in the steel industry, indicated A. J. Fisher, Bethlehem Steel Co., in his paper entitled "Fuel Oil in the Steel Industry." Large quantities of fuel oil were available and in many areas it was cheaper than coal, Btu for Btu.

The war years, 1941 to 1945 saw great military demands placed on oil and the public and industry were forced to think about coal and how it could be used to replace oil. The postwar trend 1945 to 1948 is still from oil to coal, or to fuel produced from coal. The steel industry is now trying to establish a coal basis in its operations. Catalytic cracking has enabled the oil industry to produce larger quantities of gasoline, kerosene, and distillate oils at the expense of residual oils. The installation of more and more of these "cat crackers" will mean less and less residual oils, ultimately tending to force heavy industry back into the use of coal.

The steel industry is meeting this situation in the following manner. Blast furnace gas is being used to underfire coke oven batteries and soaking pits. The coke oven gas thus liberated is being used in the openhearth furnaces up to about 50 pct replacement without a loss in steel production, and boilers are being fired with powdered coal and coke breeze to replace the blast furnace gas. If fuel oil will ultimately have to be replaced entirely by coal, the second step will be to increase the use of coke oven gas to the openhearth, supplemented by a manufactured gas of similar characteristics to about 70 pct of the total openhearth requirements augmented by 30 pct firing of tar or pitch for luminosity and flame radiation requirements. The manufactured gas could then also be used in the heating and treating operations to entirely eliminate fuel oil from the steelmaking picture. This shift from oil to coal will of necessity have to take place gradually as local conditions warrant.

Master plans for making this change in fuels should be set up in each plant and no opportunity should ever be missed in designing the plant to accomplish this purpose.

The future relation of oil to coal in steelmaking will be influenced greatly by the geographical location of the plants with respect to the coal and oil fields and by the availability and price of fuel oil.

New Production Ideas . . .

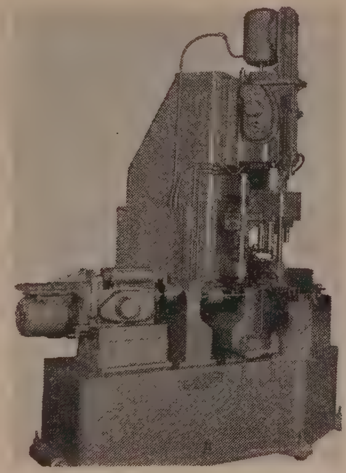
New and improved equipment and methods described this week include: Broach sharpeners, an automatic indexing machine, horizontal drilling machines, a sample punch, thread rolling, valve rocker finishing, stud welding, heat treating units, filters, small parts and gear gages, a tapping attachment, multiple drill heads, and carbide feed rolls.

Broach Sharpeners

SEVEN basic models comprise a line of broach sharpeners announced by *Colonial Broach Co.*, Detroit 13. Two sizes of machines sharpen flat broaches up to in. wide and up to 32 and 65 in. long at one setting, respectively. Round broach sharpeners are three in number and will take round broaches up to 6 in. diam and up to 6, 72 and 84 in. long, respectively, including spline, serration, and other types. The two universal models will handle round broaches having diameters up to 6 in. and up to 72 and 84 in. long, and flat broaches up to 8 in. wide and 65 and 77 in. long. All controls on the machines are at the front. All grinding wheels and headstocks are equipped with built-in motors. The spindles of the grinding wheels have a standard speed of 4000 rpm which can be increased to a maximum of 0,000 rpm through use of special pulleys. Headstocks on the round broach and universal machines have a two-speed gearing for spindle speeds of 200 and 400 rpm.

Automatic Indexing Machine

THE automatic index machine, No. 5, incorporating the newly redesigned No. 5 automatic unit that has a 10 hp capacity and 6-in. stroke, has been announced by *W. K. Milholland Machinery Co.*, 1048 Fairfield Ave., Indianapolis 5. The automatic index table is independently motor driven and synchronized with the movement of the units by means of limit switches. The index table is available in various sizes up to 42 in. with indexes up to 600 or more per hr. The machine is arranged for continuous or intermittent operation by pushbutton control, and the operator is required only to load and unload fixtures. Two or more pieces can be loaded at a station where design of part permits. Drilling, reaming, tapping, counterboring, chamfering, or spotfacing operations can be performed on the No. 5 machine.

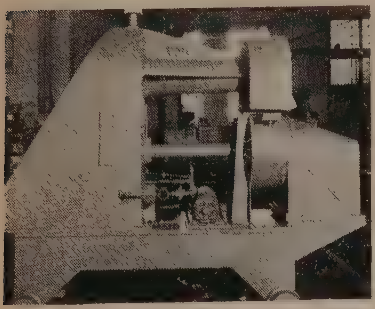


Horizontal Drilling Machine

A TWO-WAY four-spindle horizontal drilling machine designed by *LeMaire Tool & Mfg. Co.*, 2657 S. Telegraph Rd., Dearborn, Mich., uses the improved No. 1000 hydraulic feed drilling unit in drilling cross holes on a steering idler arm. The unit is driven by a 1½ or 2 hp motor and a single ram is used to provide the hydraulic feed. Feed rate is 135 ipm for rapid approach and return; slow feed can be varied from ½ to 25 ipm. Movable cams control the feed length up to 4½ in. max. stroke. The pump speed is constant with the spindle speeds of 365 to 4810 rpm by the use of easily replaced speed change gears. The spindle may be arranged with a flange for mounting a multiple spindle head or may be used as a single spindle unit with No. 1 and 2 Morse taper. Units may be mounted horizontally, vertically, or at any angle. The drilling machine consists of a center base with two end bases on each of which is mounted a No. 1000 feed drilling unit, feeding a two-spindle head. The fixture holds two parts and at each cycle of the machine 0.182 in. holes are drilled in opposite side of a yoke on each of the two arms. Production is rated at 300 pieces per hr.

Sample Punch

SAMPLES up to 4 in. diam and 0.005 to 0.020 in. thick can be cut from steel strip with a drum type sample punch, running at speeds up to 2000 fpm, *United Engineering & Foundry Co.*, Pittsburgh 22, reports. Similar machines for cutting samples from strip up to 0.036 in. thick and at speeds approaching 4000 fpm are in the design stage. Applications for this flying punch are in cold mills, particularly skin pass mills, and processing lines such as electrolytic tinning lines, where samples are to be used for rapid determination of physical properties and coating characteristics, so that proper adjustments in the rolling and processing operations can be quickly made. The punch consists of two geared drums driven by a dc motor, powered from the mill system so that the punch is at all times synchronized with the movement of the strip. The upper drum has a fixed die and the lower drum a movable punch. The sequence of operation is push button controlled and only one sample is cut out even at the highest speed. The machine may be made fixed or retractable so that samples may be taken at any point across the width of the strip. The sample is ejected from the die by a rubber ejector block without interfering with normal line operation.



Electronic Micrometer

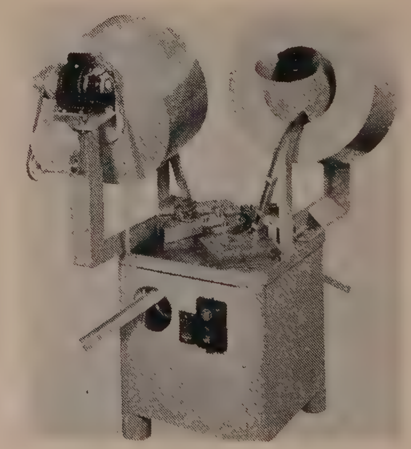
MEASURING the dimension of an object while it is moving rapidly and vibrating, is possible with the Visi-Limit micrometer developed by *Raymond M. Wilmotte Inc.*, 1469 Church St., N.W., Washington 5. The instrument is said to achieve an accuracy up to ± 0.0001 in. and may be used to produce automatic control. Type WI measures the OD of wire, tubing, rod, edge to edge dimension of extruded parts, strip stock, etc. It may be modified to measure thickness of sheet, the dimensions of certain machined or punched parts, or routine production test of several dimensions simultaneously. There is no physical contact with the object and no accurate positioning is required. Two indicating instruments give instantaneous and average values. Warning lights, recorder, and remote indicator are other features.

Hydraulic Straightening

FOR plants employing boltmakers, nut formers and other cold heading equipment using heavy wire or coiled hot rods, a hydraulic straightening device is now available that reduces down time caused when feeding a new coil of wire into a machine. This machine mechanically staightens a length long enough to pass through the feed tube and rolls and supplies power to push the straightened length into the machine. Bending of wire into a straight length; slipping or sawing off of crooked ends and manual feeding are said to be eliminated. This straightener is offered by *National Machinery Co.*, Tiffin, Ohio, in three sizes: the small model handles wire up to ¾ in. diam, the medium up to 1¼ in., and the large model up to 1½ in.

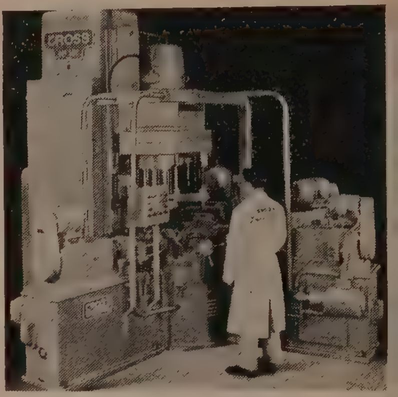
Thread Rolling Machine

BECAUSE no motion is lost by reciprocating movements, a new rotary thread rolling machine announced by *Prutton Machinery & Tool Co.*, 5295 W. 130th St., Cleveland, is said to attain production rates that surpass any attained by other methods of threading, rolling, ribbing, knurling, marking, or necking. Bolts and studs of various descriptions up to ¼ in. diam can be run through any of the above operations at a rate between 15,000 and 20,000 pieces per hr. Small and sturdy, the Rollmaster can be adapted for any particular rolling operation.



Valve Rocker Finishing

VALVE rocker shaft brackets in clusters of four parts cast in a single piece are drilled and reamed at the rate of 150 sets or 600 individual parts per hour by a single operator on a new finishing machine developed by *Cross Co.*, Detroit 7. Ten holes are finished in each casting. The unit consists of a 7-station, power-operated, index table. Loading and unloading are accomplished at an independent station while the machine is cutting two clusters of 4 parts each in every one of six working stations. Twelve sets of 48 parts are machined at one time progressively. Feed is hydraulically controlled.



Distribution Transformers

TWENTY-FIVE and 37½ kva transformers have been added to its line of CSPB units for banked-secondary operation by *Westinghouse Electric Corp.*, 306 Fourth Ave., Pittsburgh 30. The larger units make possible extension of banked-secondary operation for even heavier concentrations of load than previously possible. Proper co-ordination among these larger transformers in case of overloads or faults on the secondary is provided by new high-interrupting-capacity, type BR secondary breakers built into the transformers. A faulty transformer will be completely isolated from the system by the combined operation of the primary protective links and the secondary breakers.

Thread Staging Fixture

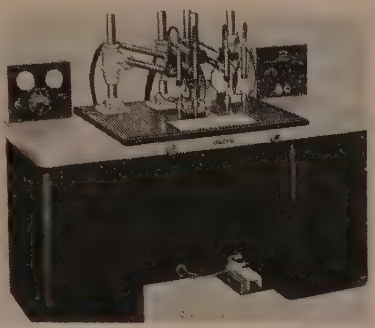
INSPECTION by optical projection of screw threads ranging in diameter from 0.073 to 1.000 in. is facilitated by the See-Al thread staging fixture designed by *Engineers Specialties Div.*, 980 Ellicott St., Buffalo 8. The device can be used on AO optical projection comparators, Kodak contour projectors, Jones & Lamson optical comparators, and Model P.25 Port man comparators. Adapters make it suitable for Bausch & Lomb contour projectors and certain other vertical type comparators. When used with the co-ordinated thread chart-gage screens, the pitch diameter, major diameter, minor diameter, crest, flank angle, worn tool allowance and lead of the screw thread can be gaged. Tapered threads in sizes 1/16-27 to ¾-14 can be inspected with the built-in adjustment feature which provides a compensation for the taper while V assemblies establish the center-line axis alignment.

Lightweight Welder

A NEW lightweight, engine-driven, dc welder, designed by *General Electric Co.*, Schenectady 5, for a wide range of general applications, with a maximum of 250 amp of welding current. The welder can be transported on a pickup truck. It is powered by a Wisconsin VF-4 air-cooled engine, speed-ratio-coupled to a GE type WD 3200 generator with 50 pct duty cycle, and weighs 660 lb. A calibrated dual control permits the accurate setting of a desired welding current before the arc is struck. The welder can be furnished mounted on a two-wheeled, pneumatic-tired trailer with a standard 62-in. track.

Stud Welding

THE basic principle of the welder announced by *Graham Mfg. Corp.*, 1643 National Bank Bldg., Detroit 26, is a capacitor-operated, self-timed device using tip studs which, on coming in contact with the work and fusing, causes ionization. This, in turn, allows a path for the main discharge current of the capacitor to form an arc sufficient to melt both the full diameter of the stud end and the work piece directly under it. This is followed by the necessary hammer blow causing the pieces to weld. Short arc time makes possible the use of very high currents. Its advantages include welding of studs on very thin metal, no fillets, no distortion of work. Studs may be welded on back of plated or painted surfaces without marring. No flux is necessary, so that the welding of dissimilar metals is possible. Stud dimensions are up to ½ in. Portable or stationary units are available and welding pressure is mechanical or pneumatic.



Superhard Welding Rod

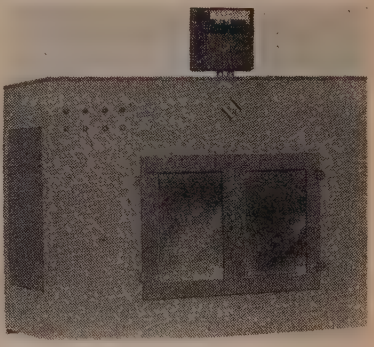
WORN machine parts of cast iron or steel can be salvaged with the new Eutechrom, superhard, low heat welding rod designed by *Eutectic Welding Alloys Corp.*, 40 Worth St., New York 13, as a universal rod to overlay worn or defective parts. The electrode is coated with a special Frigidarc coating that permits the use of the lowest possible current, thus cutting down the amount of heat required and minimizing the risks of distortions, warping, and cracking. It gives the extreme hardness of Rc 62, and is available in ¼, 3/16, and ⅛ in. sizes.

Electric Furnaces

BENCH-TYPE electric furnaces for laboratory use and heat treating carbon steel and high chromium steel and tools have been announced by *Thermo Electric Mfg. Co.*, Dubuque, Iowa. Six sizes range in chamber dimensions from 4 in. wide x 3½ in. high x 4½ in. deep to 8½ in. wide x 7½ in. high x 18 in. deep. The furnaces are fast heating and may be operated up to 1650°F for continuous use and to 1900°F for short periods. Heavy gage nickel-chromium heating elements are embedded in refractory plates that form the sides, top and bottom of the heating chamber, thus protecting them from physical damage, minimizing oxidation and providing even heat distribution. Doors are uplifting counterbalanced except in the two largest models, which have horizontally divided doors, permitting the bottom half to be lowered separately. Four sizes operate on 115 or 230 v 50/60 cycles; the two largest on 230 v.

Industrial Ovens

PRODUCTION of a standard line of laboratory type industrial ovens with operating range up to 700°F, and accuracy guaranteed to within ±0.5 pct, has been announced by *K & H Industrial Products, Inc.*, 459 Morgan Ave., Akron 11, Ohio. Model KHD-145 bench type oven, illustrated, is the largest of the line, having interior dimensions of 30 in. high x 40 in. wide x 22 in. deep. It employs eight 1350 w Chromolox resistance fin strip heating elements, and features controlled, forced-air flow to assure uniform and even distribution of heat throughout the oven chamber. Temperature setting and control is provided by a Bristol electronic input controller of either control-indicating or control-indicating-recording type. Oven controls can be mounted on oven or at a location for remote control.



Filters

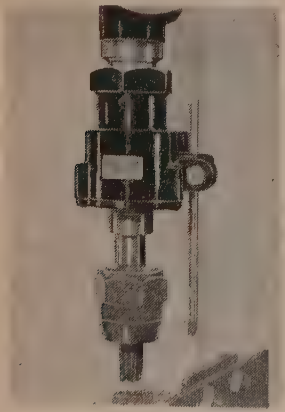
A NEW series of filters constructed of Saran-lined steel pipe and fittings and rubber-lined filter and precoat tank has been announced by *Titeflex, Inc.*, 554 Frelinghuysen Ave., Newark 5, N. J., for use in the plating and chemical industries and in other industries where corrosive liquids are filtered. The filters can be used at temperatures between 0 and 180°F for general service. The filtration principle used consists of a rigid synthetic membrane of porous stone used to support a filtering medium called filter aid. A few cents worth of filter aid serves for each batch filtered and cleaning is accomplished by back-washing. Filters are operated by turning a few valves and are almost automatic. Suspended particles down to 1/10 micron are removed.

Magnetic Starters

BULLETIN 4112 size 2 ac magnetic starters, developed by *Ward Leonard Electric Co.*, Mount Vernon, N. Y., are solenoid-operated starters for general and special purpose applications where across-the-line, non-reversing starting of polyphase squirrel cage induction motors and single phase motors is permissible. Starters are available with open type construction for built-in or specialized controls, or with NEMA type I general purpose enclosures. Starters can be controlled by separate pilot devices or can be supplied with local control pushbuttons or selector switches. The starters have a maximum enclosed rating of 25 hp, 440-550 v, 3 phase, 60 cycles.

Tapping Attachment

A NEW heavy duty, positive gear drive, automatic reverse tapping attachment for use in back geared drill presses has been introduced by *Dorman Machine Tool Works*, South Mount Vernon, N. Y. This unit will drive and automatically reverse ¾ to 2-in. pipe taps and standard hand or machine taps. The tap holder is collet type.

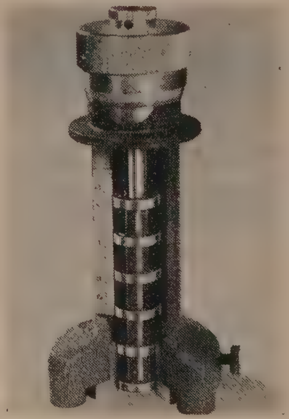


Multiple Drill Head

MULTIPLE, adjustable drill heads in a new heavy duty series, offered by *Strutz & Mead, Inc.*, Milwaukee 2, are made in 2 to 8-spindle models. Bolt circles vary from 2 3/16 to 14 63/64 in. in the 2-spindle head to 7 31/64 to 20 17/64 in. in the 8-spindle head. These heavy duty heads will drill holes up to 1¼ in. diam in cast iron. They are equipped with No. 3 Morse taper spindles having a 1-in. vertical drill adjustment. The drill heads feature anti-friction bearing construction throughout and all gears are of SAE 4615 carburized and hardened. One set of positioning templates is furnished with the head.

Small Parts Gage

A NEW portable 6-in. gage has been designed by *Cadillac Gage Co.*, 20315 Hoover Rd., Detroit 5, for the checking of gages, tools and dies, either on the surface plate or at the machine. The gage, called the Pla-Chek, is completely self-contained and simple in operation. Its portability permits it to be checked in and out of the tool crib. It is claimed the gage is accurate to 0.00005 in.



Carbide Feed Rolls

SOLID carbide feed rolls used in a B & S automatic screw machine have saved 10 hr of grinding and resetting time and have given trouble free operation, *Carboloy Co., Inc.*, Detroit 32, reports. Two types of solid carbide rolls are used, V type and the flat type. The V-type roll is 2⅛ in. diam x 1⅛ in. wide. The steel hub in this roll has a tapped hole for set screw and a keyway for driving. The flat rolls are in two sizes—2⅝ in. diam x ¾ in. wide, and 2⅛ x ¾ in. These handle bar stock from 5/32 to 1 in. diam.

Gear Gage

FOR a quick check of gears, a stainless steel gear gage is now made with 20° pressure angle full length tooth form 3, 4, 5, 6, 8, 10, 12, 16, 20, 24, 32, 48 and stub tooth forms 3/4, 4/5, 5/7, 6/8, 8/10, 10/12, 12/14, 16/21, 20/26, 24/32, 32/42, 48/64. In a matter of seconds by merely rolling the gage over the teeth of a gear the pitch can be instantly gaged without chance of error. The instrument is available from *George Scherr Co.*, 200 Lafayette St., New York 12.

Surface Roughness Scales

A POCKET-SIZE surface roughness comparator for sight and feel comparison with machined finishes has been announced by Special Products Div., *General Electric Co.*, Schenectady 5. The comparator is composed of two small metal rules 6 x 1¼ in., illustrating degrees of roughness ranging from the smoothness of a bearing surface to the roughness of a flame cut. One side of each scale is divided into 12 surfaces, depicting a total of 24 different surfaces which are grouped into 10 degrees of surface toughness. Every degree is identified by a number that designates the nominal roughness in micro-inches.

Stacking Box

ALL-STEEL welded stacking boxes for handling miscellaneous parts have been announced by *Palmer-Shile Co.*, 16005 Fullerton Ave., Detroit 27. The box has four-way entrance with a corrugated bottom. It is supported by four angle legs with shoes for floor protection. Square box construction permits stacking any way. Boxes are built in any size to customer requirements.

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WALTER G. PATTON

• Automobile steel buyers are leaning toward broader use of "H" hardenability bands . . . New Olds engine plant expected to set the pattern for many future plants . . . Ford shows its Ypsilanti plant.

DETROIT—Prospects that automobile companies will be ordering alloy steel on the new hardenability-band specifications are growing brighter every day.

The report recently issued by the Iron & Steel Technical Committee of SAE based on a survey of 22 companies shows that car manufacturers are able to produce more uniform parts and with fewer heat treatment troubles where they use "H" specifications instead of the normal chemical specifications.

Auto manufacturers also indicate the use of "H" specifications reduces the number of changes in tempering temperature necessary to keep their products within hardness limits.

With only minor exceptions, progressive automobile metallurgists are now ordering their steel on a hardenability basis. In some instances, as in the case of Chevrolet, a hardenability band slightly narrower than the standard "H" specification is used. In this instance, the user pays a premium for the steel.

The growing acceptance of hardenability by the automotive industry is clearly indicated by a recent response to a questionnaire sent out by the Hardenability Div. of SAE Iron & Steel Technical Committee. The questionnaire prepared by the committee headed by F. C. Young, Ford Motor Co., was sent to automotive, tractor and aircraft industries and 27 replies were received.

Three years ago only one manufacturer was using the new "H" band, or hardenability specifications. By last fall 14 of the 27 companies replying to the questionnaire were using hardenability bands and 8 more were using some sort of hardenability specifications. Only 5 companies did not incorporate any kind of hardenability requirements in their specifications.

Ordering steel on the hardenability basis eliminates approximately 3 or 4 pct of the heats of standard analysis which are lowest in hardenability and a similar percentage of the ones which are highest in hardenability. At the same time this machine permits a steel mill to meet specifications where the percentage of a single element may be beyond the specification range. It should be pointed out, however, that although some latitude is permissible so far as single chemical elements are concerned, closer control of *total* chemical analysis is required to meet the new "H" specifications.

REPLIES to some of the questions asked by the SAE Committee are interesting. For example, a total of 5 users (out of 23) reported fewer rejections for hardness with "H" steels of the carburizing grade. Among 23 users of heat treating grades, 11 reported reduced rejections for hardness with "H" steels and only 5 said there was no difference in the number or rejections because of failure to meet hardness requirements.

One of the significant gains through the use of "H" bands is the reduction of distortion. Out of 14 users commenting, 6 indicated less distortion with the "H" steels.

Among 14 users of heat treated steels, 4 reported reduced rejections due to quench cracking and 5 out of 14 said there was less distortion with the "H" steels.

Two users of "H" steels reported less difficulty with straightening and 3 additional users reported improvement in machining or forming.

Present indications are that the SAE Committee may soon be in a position to abandon entirely its earlier reliance on calculated hardenability bands. Sufficient data has now been accumulated to permit the drawing of "H" bands based entirely on actual data, it is reported.

Members of the Hardenability Div. of the SAE Technical Committee met in Detroit, October 4, at which time replotting of the present hardenability bands was initiated. Based on past experience it is believed that the present "H" bands may be narrowed for some steels.

THERE are, of course, some obvious advantages in the present development so far as steel companies are concerned. Eventually this development could leave chemical specifications, with only a few exceptions, at the discretion of the steel mills. This will naturally minimize problems arising from scrap contamination. It will also permit mills to ship steel that is out of specification so far as a single element is concerned. At the same time, it permits users to reject steel which may be within chemical specification limits but lacks sufficient hardenability for the part.

It is expected here that the present trend in the direction of "H" band steels will continue—if it is not actually accelerated. It now seems assured that hardenability specifications will soon be the accepted practice by the majority of steel buyers in the automobile industry.

Probably the best available blueprints of things to come in the automobile industry are the new Kettering engine and the $10 million plant Oldsmobile has in opera-

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It takes a world of skill, experience, and ingenuity to make a good toolmaker. It takes the best of precision equipment to make his ability pay off.

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Full details on these worthy companions for good toolmakers will be sent on request.

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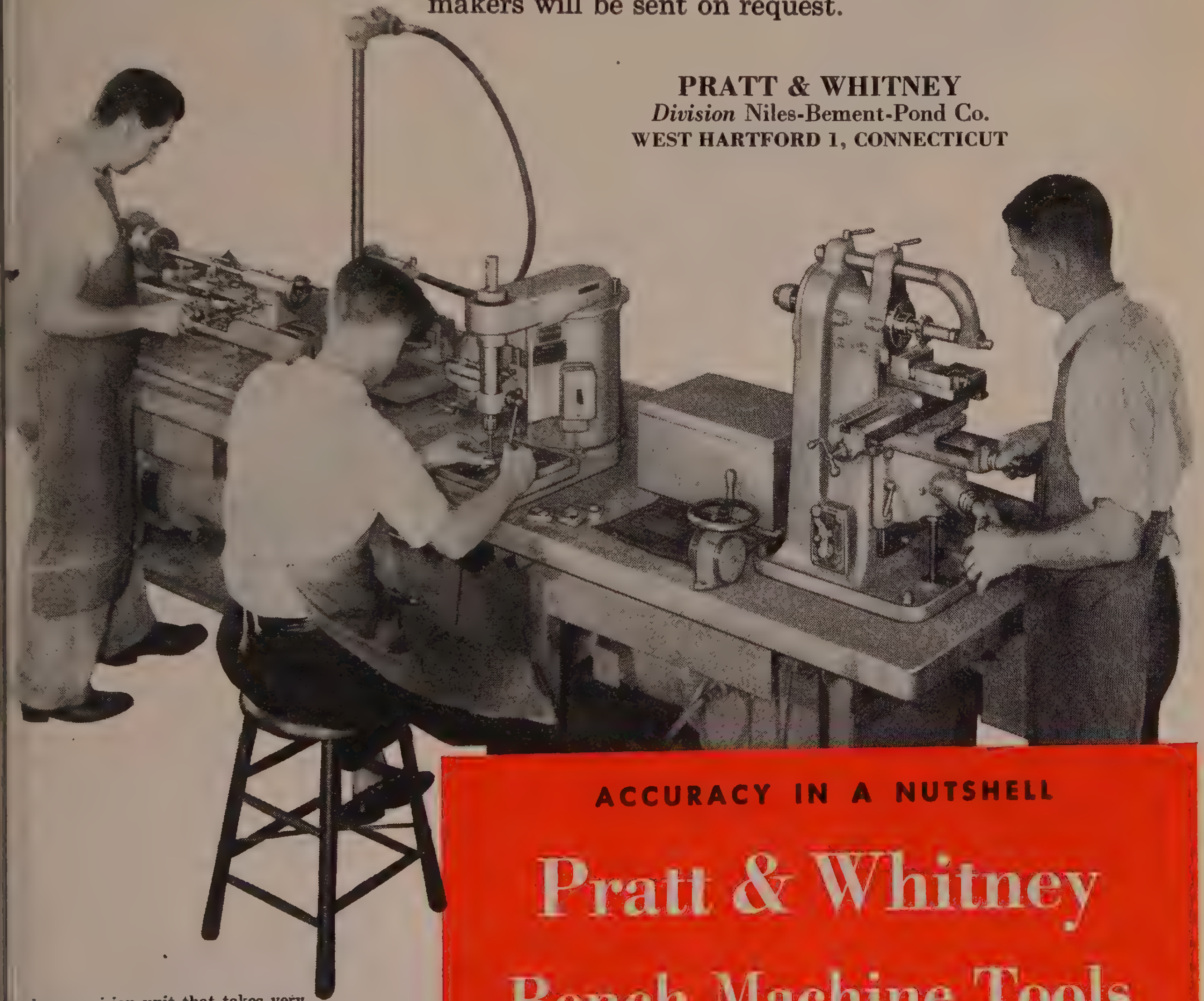

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x Drive Unit for Tool Post Grinding
tachment, Sigourney Sensitive Drill
ld by P&W), and P&W Model "C"
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HERE IS NO BETTER-PAYING INVESTMENT THAN THE RIGHT TOOLS FOR THE JOB" tion at Lansing, to build the new engines.

Merely by changing the head, the present compression ratio of the engine (7.25 to 1) can be increased to 12.5 to 1. Such a change will permit fuel economy in city driving of better than 40 pct.

The new engine is 10 in. shorter than the present straight eight and many changes in future cars will be based on the desire to take advantage of this characteristic. Girth of the engine is increased somewhat. The hp has been boosted from 115 to 135. The new V-type engine has five main bearings, a shorter stroke and slower piston speed than the present Olds powerplant.

While it may be some time before the new "Kettering engine" operating at high compression ratio is available in your car, the new plant in which the engine is being built at Lansing undoubtedly surpasses anything the industry has achieved thus far.

The new layout has the most elaborate and latest transfer type machine tool equipment. One machine controlled by a single operator is 86 ft long and has 18 separate work stations. Another machine has more than 90 special cutting tools working simultaneously on 17 engine blocks.

The new $10 million plant has more than two miles of conveyor lines. The final 360 foot assembly line indexes at the end of each operation cycle, permitting the operator to accomplish his assigned task while the engine is stationary. The conveyor is of the flush-floor type, permitting the operator to walk around the engine which is mounted on a movable pedestal.

Oldsmobile officials are undoubtedly being modest when they say that the new engine plant is the most scientifically planned production facility in the 50 yr history of the company. The entire plant was laid out a year in advance, using a three dimensional model built to exact scale of ¼ in. per ft. More than 3200 individual pieces of equipment were laid out on the 8 x 12 ft model. Every detail pertaining to overhead conveyors, chip conveyors, air lines, water lines, fixtures, machines and control equipment was painstakingly planned in advance.

The capacity of the new plant is 30 units per hr. By November, an ouput of 5000 engines per month is expected.

Engines are given 100 pct inspection as they come off the assembly line. A 45 min. dynamometer test is used to check performance of each engine. Torque control equipment is available to handle 40 engines simultaneousl

When maximum output is reached, about 750 employees will b required. Workers are presentl being trained and transferre from the six and eight-cylinder in line engine plant which will continue in operation only on a reduced schedule making replacement engines.

Ford Plant Additions Are Step In Direction Of Decentralization

Detroit

• • • **Ford's program** to decentralize its operations took another step forward this week with the dedication of its Parts and Equipment Manufacturing Div. at Ypsilanti, Mich. Plant additions include a one-story manufacturing wing housing the voltage regulator and ignition coil operations, a power house and a transportation garage. Manufacturing floor space for this operation has been doubled.

The second addition is a two-story administration building that houses the executive, engineering and accounting offices. Construction of the new buildings which was started last March was completed this month.

At the present time, the Ypsilanti plant manufactures generators, starters, voltage regulators and ignition coils for the complete line of Ford cars, trucks and tractors, including the Lincoln and Mercury Div.

The entire construction program has added 145,000 sq ft to the Ypsilanti plant.

In addition to the Ypsilanti plant, Ford is currently operating the following Michigan parts plants: Dundee, welding equipment; Brooklyn, distributors an electric switches; Milford, carburetors; Waterford, taps, drill and gages; Manchester, dash an engine instruments; Flat Rock head lamps and tail lamps; Northville, valves. In addition, a radiator and spring plant is in operation at Green Island, N. Y. and coil spring and wheel plant is located at Hamilton, Ohio.

The voltage regulator operatio was formerly located at Milan Mich. and the ignition coil production was at Phoenix, Mich. Thes plants have now been closed.

Roscoe M. Smith is general manager of the Parts and Equipmen Manufacturing Div. Del S. Harden vice president and director of manufacturing represented Ford Motor Co. management at the dedication ceremonies.

New Project

• • • Recent developments point to the possibility that General Motors will start work within the next few months on its new technical center on Mound Road, Detroit.

The research center was announced with much fanfare in midsummer 1946 but was later shelved. Present information indicates that only those GM research departments operating today under considerable pressure will be accommodated by the sections of the project to be started in the near future.

New Detroit Firm Will Sell, Warehouse Stee

Detroit

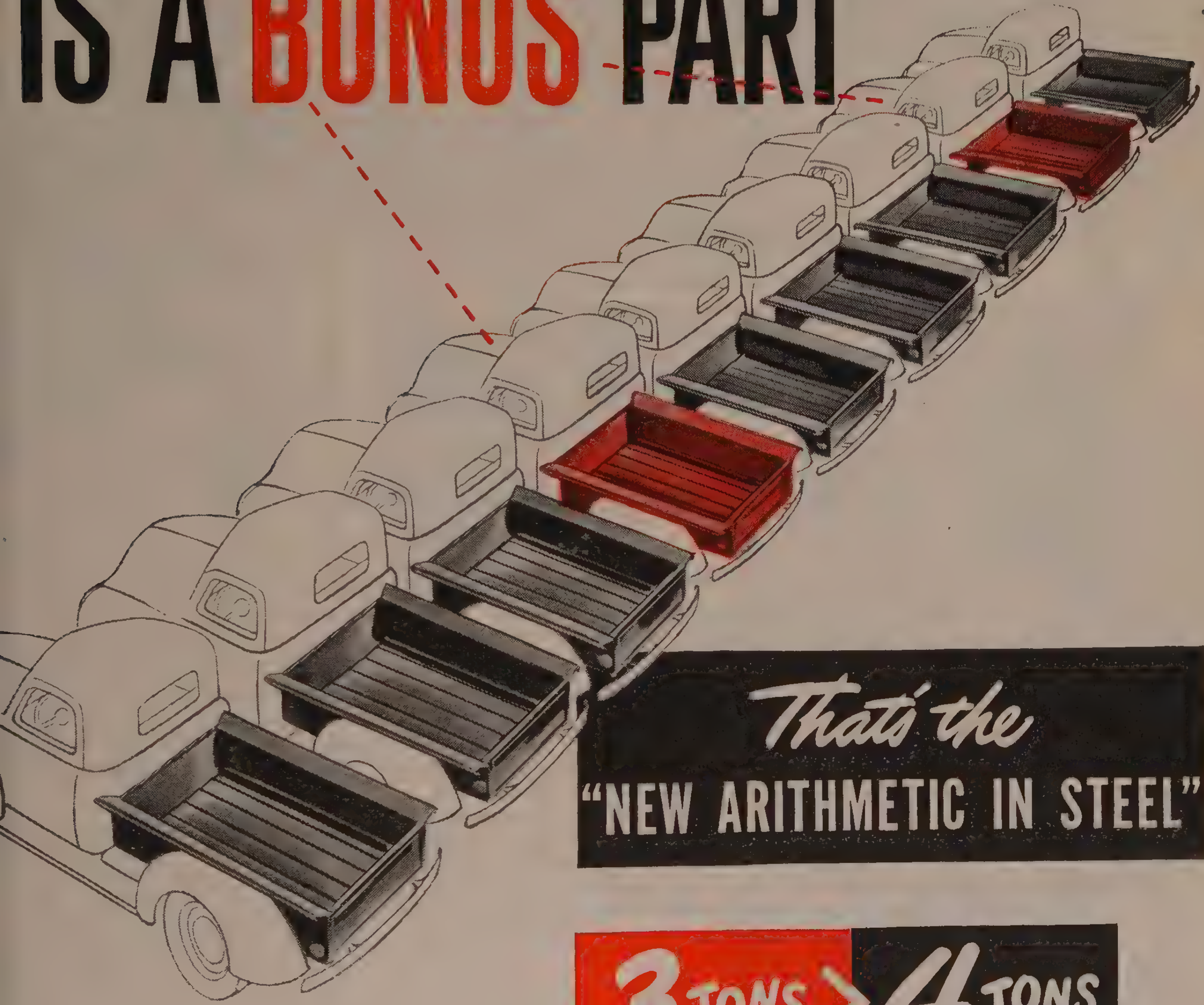
• • • **Articles of** incorporatio for Alloy Steels, Inc., have bee filed in Michigan for $250,000 fo the purpose of selling and warehousing alloy and specialty steel in the Detroit area. Initial operations will be in the tool steel fiel The warehousing of hot and col rolled low carbon sheets and stri is not contemplated, according t a company spokesman.

James D. McKnight, formerl associated with Allegheny-Ludlu Steel Co. in Detroit, is presiden and treasurer of the company Principal stockholder in the ne enterprise is Donald B. McLouth president of McLouth Steel Co Detroit.

The company has acquired tw modern buildings at 7055 Intervale, Detroit.

According to McKnight, a tota of $220,000 has been paid in an a sales organization is now bein formed. Warehousing operation on a limited scale have alread started, it was explained.

VERY FOURTH PART IS A BONUS PART



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IGHT 1948 GREAT LAKES STEEL CORP.

Washington . . .

EUGENE J. HARDY

• Industry discusses basing point legislation . . . Robinson-Patman Act amendments key to problem . . . Delivered pricing would be legalized . . . But not basing points.

WASHINGTON — Increasing attention is now being focused on the possibility of legislation to undo the possible harmful economic effects of the Supreme Court decision in the cement case. While there is still some talk that a clarification of the Federal Trade Commission's position on freight absorption, particularly its interpretation of the terms "individual" and "systematic" might bring about a quick settlement of the current case against the steel industry, there is little indication that the commissioners will be forced into such a clarification in the immediate future.

The investigation by the Senate Committee on Trade Policies might eventually bring forth a clarification, but, in the meantime, industries affected by the elimination of delivered pricing are thinking more and more of legislation. Thus far, there has been little cohesive effort to present a common front before Senator Capehart's committee, but discussions are going on in the steel and other industries and the line of thought is slowly being directed into a specific channel—legalization of delivered pricing.

It appears certain that steel industry leaders are now convinced that Congress is not going to legalize the basing point system or any other delivered price system by name. There can be little argument that such an approach would fail if for no other reason than the dynamite-laden political consequences involved. Then, too, Big Steel has already indicated that it would not return to the basing point system even if the Supreme Court decision in the cement case were set aside.

But, perhaps, more important is the fact that any attempt to legalize a particular system by name would require exhaustive definition which might merely challenge the ingenuity of the Federal Trade Commission's attorneys to misconstrue it as has been done with the Robinson-Patman Act.

THE objective of the steel and other industries appears to be a system that will permit them to meet competition "systematically" in any and all markets, regardless of the pricing method involved. Some steel leaders say this can be done under f.o.b. mill pricing, provided a uniform mill net is not required.

Accordingly, legislation to relieve the commission of its weapons of attack on delivered pricing is receiving active consideration in steel circles. The most carefully thought out proposal to come to the attention of THE IRON AGE to date covers many points. The most important would be the elimination of the commission's theory that "price" under the Robinson-Patman Act means "mill net return."

The commission should also be prohibited from declaring that it is unlawful to meet competition by absorbing freight systematically and, in addition, should not be permitted to outlaw a delivered pricing method as such, merely because there has been a price-fixing agreement among the producers in
the industry in question, accordin
to these sources.

Affirmatively, this could be don
by amending the Federal Trad
Commission and Robinson-Patma
Acts. To safeguard the whole pro
posal and keep the Justice Dept
from getting into the act it is als
suggested that similar amendment
be made to the Sherman Act.

THIS proposal, which probabl
will be presented to the Cape
hart Committee in the not too dis
tant future, would amend the Rob
inson-Patman Act so that: "(1
Price will be defined to mean th
'delivered price.' (2) It will b
clearly stated that any seller
privileged to make a lower price t
one customer than to another t
meet a competitor's equally lowe
price to the second customer and t
do so as frequently and 'system
atically' as he wishes and in an
territory or marketing area tha
he wishes and without regard t
whether or not his competitor
may be similarly meeting his an
each other's prices."

To clinch the case it is furthe
suggested that the Federal Trad
Commission and Sherman Acts b
amended to the effect that "n
cease and desist order or injunctio
issued under either statute in
case where any agreement, unde
standing, combination, conspirac
or agreed common course of actio
in restraint of trade has bee
found shall prohibit, or be co
strued to prohibit, the individu
and independent use by any part
to such agreement, understandin
etc., of any business practices
method of pricing or selling not
itself unlawful, regardless
whether or not such practice
method was the subject of suc
agreement, understanding, etc."

Attorneys skilled in antitru
practice believe that legislation
this type might get through Co
gress since it does not legalize co
spiracies or price-fixing agre
ments. Nor does it seem to relie
an industry which had been ordere
to stop conspiring from the nece

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erator Only

WITH ITS MANY PLUS FEATURES . . . you can't afford to own any other welder than HOBART

Gasoline Engine
Driven D-C Arc Welder

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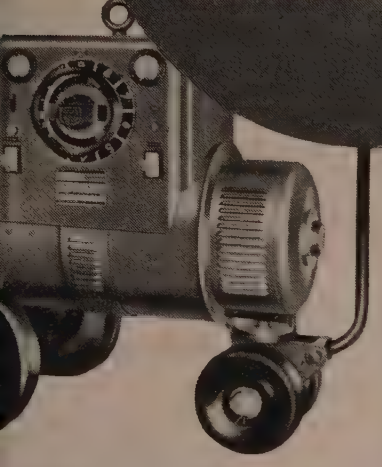
Gas Drive Arc Welder

Industrial
Type Transformer
A-C Arc Welder

. . . the cost cutting welder of today's production lines

Hobart engineers see to it that you get extra value, more copper, more capacity, cooler running, easier handling of all kinds of rods and longer welder life.



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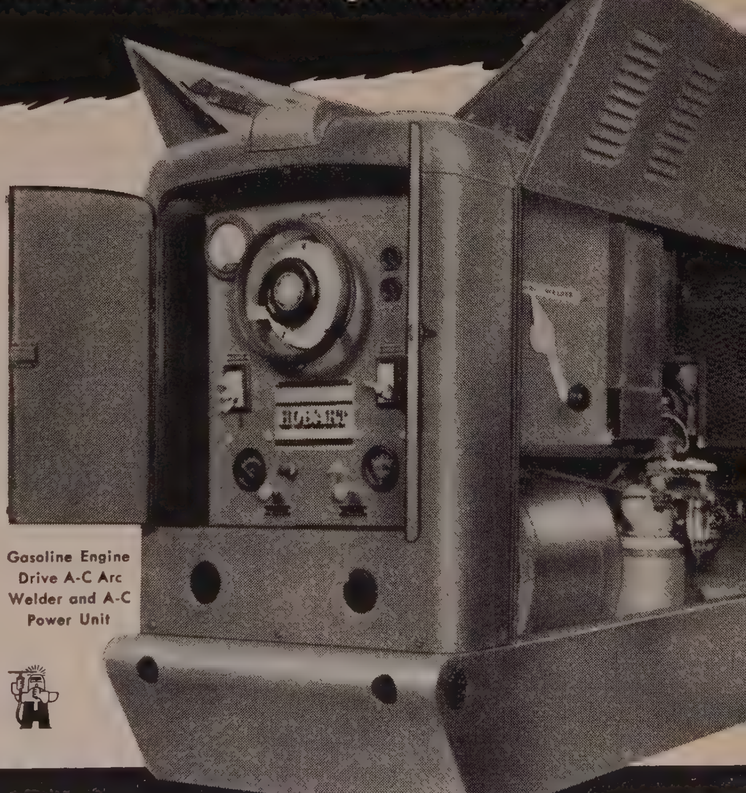
Arc welder efficiency is of vital importance in oday's stepped-up production schedules. Welder re means "time out" for the machine and men, interrupted schedules, and lost profit.

Hobart "definite purpose" arc welders provide a iable source of welding current to do any welding job – they are famous for their unfailing ependability – and they give you more production at less operating cost.

farsighted manufacturers have standardized on bart Arc Welders. They know that dependability and continuous operation are of paramount ortance in a good welder . . . and they know that rt welders have longer life and less maintenance costs. If you manufacture anything from metal, bart can furnish a welder that will fit your needs. Return coupon today for complete information.



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Drive A-C Arc
Welder and A-C
Power Unit

BART BROS. CO., BOX IA-108, TROY, OHIO

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wish you had

HOBART WELDERS

HOBART *"One of the World's largest builders of arc welders"*

rt Electrode Plant in Troy, Ohio is day and night to meet the great de Hobart quality electrodes. In spite of y production schedule, Hobart Elec e precision made and rigidly in guarantee the highest quality elec t the newest machinery can produce.

HOBART BROTHERS COMPANY, BOX IA-108, TROY, OHIO

Please send me complete information on the welder checked below and illustrated above.

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4. ☐ "Weldmobile"
5. ☐ Industrial A-C
6. ☐ Gas Engine Drive A-C
☐ Electrode Catalog

☐ free– Brand New ''Weldors' Vest Pocket Guide,'' check coupon for your copy

NAME

FIRM

sity of changing those business practices found to have been agreed upon in order to break up the conspiracy.

SUCH a bill would not by any means legalize all types of delivered pricing systems. It would not, for example, legalize a single basing point system such as "Pittsburgh plus", nor would it legalize the collection of so-called "phantom freight". Certain types of zone pricing systems would also remain outside the law. But it would permit the two most important types of delivered pricing methods, namely, a variation of multiple basing point system where every plant would sell f.o.b. mill, absorbing freight where necessary to meet competition, and the universal delivered price system.

In addition, it would legalize such variants of the above as the maximum freight allowance. It would permit anyone to sell on a straight f.o.b. mill basis, but it would not force anyone to do so.

It may be a little premature to consider permanent legislation at this early date, since the Capehart investigation is just getting underway and any reports will be some months off. However, it is not unlikely that legislation of the type outlined above may be offered as a stop-gap measure to preserve the status quo in industry until an intensive study can be completed. And if Democratic attempts to drag the investigation into the general field of antitrust activities are successful legislation may come sooner than had been expected.

Minimum Age Planned For Several Hazardous Jobs

Washington

• • • **The Labor Dept.** has drawn up an order which would set 18 years as the minimum age limit for operators of a broad classification of metal-working machinery. Seven hazardous occupation orders have been previously issued under the Fair Labor Standards Act.

A public hearing on the proposed order has been scheduled to be held in Washington on Nov. 9.

This action was taken after a comprehensive investigation conducted for the purpose of finding out which types of machine operation are particularly hazardous to young workers.

The investigation covered two classifications of metal-working equipment — machine tools and forming, punching, and shearing machines. It is estimated that 2 million items of such equipment are in use in the United States.

Under the proposed order, the age limit would be raised from the present 16 to 18 years for either operator or helper on machines used for working cold metal. This limitation would not apply to machines used for working exclusively on hot metal.

Notice of intention to appear at the hearing must be filed at least 5 days in advance.

THE BULL OF THE WOODS

BY J. R. WILLIAMS

I SEE MY OLD LATHE IS STILL IN USE!
GUYS LIKE HIM GIT UNDER MY SKIN! THEY HAD TO GO INTO SUMP'N ELSE TO MAKE GOOD-- THEN THEY COME BACK AND STRUT AROUND WITH TH' BULL O' TH' WOODS!
YES, HE GOT UP IN SHOP SOCIETY BY BEING OUT OF IT! HE WAS SO DUMB HERE TH' SWEEPER WOULDN'T SPEAK TO HIM!
THE BIG CHEESE
10-8
J.R.WILLIAMS
COPR. 1948 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

New Procurement Offices

Washington

• • • **Five additional** field procurement planning offices have been established by the Army Engineers to facilitate current planning for a possible emergency industrial mobilization, Lt. Gen. R. A. Wheeler, Chief of Engineers has announced.

The new offices are at Cincinnati, Dallas, Detroit, Philadelphia and Seattle. Other procurement planning offices established during recent months are in Chicago, New York, St. Louis, Atlanta, Pittsburgh and San Francisco.

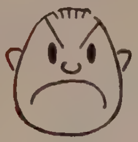
"The new procurement planning offices are part of a nationwide defense plan developed by the Munitions Board of the National Military Establishment," General Wheeler explained. "This type of planning during peacetime should eliminate many of the extensive gaps in our preparedness which hampered industrial mobilization for previous wars."

Joins Standards Staff

Washington

• • • **Toivo M. Liimatainen,** formerly associated with the Sylvania Electric Products Co., has been appointed to the staff of the Electron Tube Laboratory, National Bureau of Standards, where he will work on the engineering and development of microwave tubes.

Oakite Composition No. 97 gets rid of these four metal-cleaning headaches . . .



- fire hazards
- solid-particle residues after grease is removed
- toxic vapors
- foaming solution

gives you these four advantages . . .

- economical water-diluted emulsions
- long life for cleaning solutions
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Metal-Cleaning Jobs You Can Simplify with Oakite Materials

STEAM-CLEAN with Oakite Composition No. 92. Speedy detergency combined with heat of steam saves time. Data in *free* Service Report 7238.

REVERSE-CURRENT cleaning with Oakite Composition No. 90. High conductivity; controlled foam; long solution life. Details on request.

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BALL-BURNISH with Oakite Composition No. 3. Superior lubrication; rich suds; works in hard or soft water. Data *free* in Service Report 6705.

To get the above Oakite Service Reports FREE, check, clip and send with your name to Oakite Products, Inc., 24 Thames St., New York 6, N. Y.

SPECIALLY designed for spray-machine washing of steel, brass and zinc parts, Oakite Composition No. 97 quickly wets and dissolves the grease binders in buffing compounds and similar deposits . . . penetrates and loosens dirt formations for easy rinse-away. Use Oakite Composition No. 97 to clean and degrease metal before pre-paint treatments, machining and electrocleaning.

At no cost to you, the Oakite Technical Service Representative will gladly show you how Oakite Composition No. 97 can fit economically into your metal cleaning procedures. Contact him or write us and we'll have him call.

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Technical Service Representatives Located in Principal Cities of United States and Canada

MATERIALS
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Specialized Industrial Cleaning

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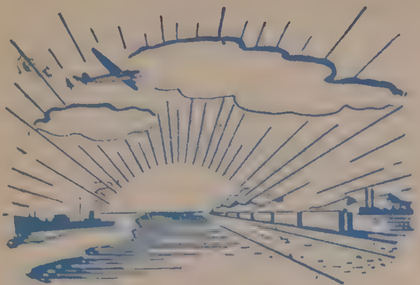
LIBRARY

West Coast . . .

OSGOOD MURDOCK

• Scrap and pig iron shortages limit growth of heavy industry . . . Outmoded airports retard use of jet airliners . . . New bridge will cut down ferry travel at Seattle.



SAN FRANCISCO—"Pig, Pig, Who's Got the Pig" is a new game to the far West that has taken heavy industry by storm. Those old days before the war, when steel economy along the Pacific was tenuously built on abundant and cheap scrap, seem to have gone forever. But each new move in the volatile and rapidly changing industrial pattern and outlook complicates and confuses the prospects for ferrous raw materials.

When the Kaiser interests announced last week that their new $60 million plate contract would allow construction of a second 1200-ton furnace at Fontana, with corresponding additions to the coke plant, utilities and by-product equipment there, southern California foundrymen were joyous in acclamation, in the prospect that they should be able to pick up at least a few crumbs of pig iron from the doubled supply. In a situation as tight as the present one here, even possible prospect of slight relief from nine months to a year away brings smiles and cheers.

But cooler analysts suggest that this latest development may add only fuel to the unquenched fire of future iron and scrap steel shortages.

Before 1943 the pig iron requirements of the entire steel producing capacity of the West Coast, along with the foundries and single pressure cast pipe plants, was supplied by the lone blast furnace at Provo, Utah with a capacity of 600 tons per day. As of today three furnaces at Geneva, two at Ironton (Provo) and one at Fontana have a combined daily capacity of 5350 tons, practically nine times prewar.

The additional 1200 ton stack at Fontana will raise this total above 6500 tons daily or 11 times prewar. Prophets in the war days were predicting that pig iron would be running out of the ears of the far West. Yet, like the well trussed city lady visiting the county fair on a hot day, every move seems to increase the squeeze.

The answer, of course, is in greatly increased open hearth and finishing capacity and the severe and unexpected decrease in supply of scrap. Gray iron foundries have doubled their percentage of pig charge from 15 pct before the war to 27 pct in 1946 and over 30 pct currently. So demand from and shipment to the foundries has doubled, and these harassed buyers have to piece out with contracts and shipments by rail from the Midwest at Cleveland base plus 50 pct.

If and when the United States Cast Iron Pipe Co. builds its contemplated new plant at Richmond on San Francisco Bay, there will be a new hungry mouth to be fed. From time to time recently, fairly substantial shipments have been made from the war plant furnace of the Lone Star Steel Co. at Daingerfield, Texas, but operating difficulties forced that furnace to shut down two months ago.

Effective Nov. 1, Columbia Steel Co. will take over the direct sale of all pig iron from Geneva available to foundries and other outside customers. For many years Balfour Guthrie & Co. Ltd. were exclusive brokers and selling agents for Provo pig. More recently other foundry equipment brokers and selling agents have had an opportunity to participate, before the supply shrank and demand mounted. The new Columbia department will be under the management of Harry Rogers.

SEATTLE—In an interview here last week Sir Frank Whittle, inventor of the jet engine, stated that jet airliners could be put into operation today if it weren't for today's outmoded airports.

"The jet engine and the plane are ready for use, but the airport and its traffic control methods are holding back the jet airliner," Sir Frank stated. He stated that almost any of the present aircraft manufacturers could build a jet plane that would be efficient to operate on an airline under the right conditions. The jet plane can't, however, be stacked in a traffic pattern over an airport for an hour or more as is the custom today. It must land within ten minutes of its estimated time of arrival.

To bring about the jet transport, Sir Frank stated, industry will have to develop radar to the point where it will tell ground personnel where a plane is every minute it is in the air. And new traffic control methods must be developed too. Sir Frank believes that it will take about five years before any type of jet transport will go into operation, and then the plane will be a turbo-jet. This type will bridge the period between the conventional plane and the jet thrust airliner.

* * *

• • • **Puget Sound** Naval Yard at Bremerton will soon construct extensive submarine repair facilities, the Navy Dept. final approval of this work having been granted. The additional work will involve additional personnel, and plans fit in with the new type Navy subs and carriers so Bremerton seems assured an important role in the future.

* * *

• • • **Bids were opened** Oct. 1 on the Agate Pass bridge, a span that will connect Bainbridge Island to the mainland across the Sound

HYSTER *faster*

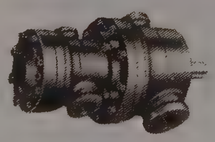
Hyster 150 Heavy Duty Industrial Lift Truck
Capacity 15,000 Pounds

WITH VICKERS HYDRAULIC EQUIPMENT FOR STEERING . . . HOISTING . . . TILTING

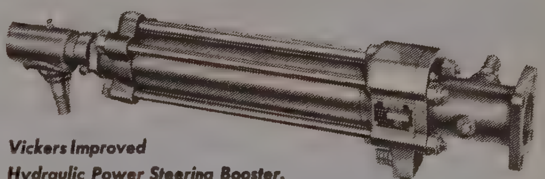
The "Hyster 150" heavy duty industrial lift truck handles more work easier and faster because it utilizes Vickers Hydraulic Equipment for steering, hoisting and tilting.

Vickers Hydraulic Power Steering Booster makes steering easy no matter how tough the going. Road shock cannot be transmitted to the steering wheel because the steering load is carried by a hydraulic cylinder—not by the driver's muscles. An integral relief valve automatically protects the system against damage by overload.

The Vickers Double Pump that supplies the power for hydraulic steering also provides oil under pressure for actuating the cylinders that lift and tilt the load. This Vickers Vane Type Pump is exceptionally efficient and dependable. The exclusive hydraulic balance construction prolongs pump life by entirely eliminating pressure-induced loads and consequent wear. The vanes provide automatic take-up so that wear has no appreciable effect on performance. In addition, the pump automatically maintains correct running clearance throughout a wide range of operating conditions.



Vickers Double Pump for simultaneously supplying power to two separate hydraulic circuits.



Vickers Improved Hydraulic Power Steering Booster.

For additional information regarding other advantages of these Vickers units, write for the following bulletins: Vickers Vane Type Pump—Bulletin 36-12. Vickers Power Steering Booster—Bulletin 47-30.

3473

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LPHIA • PITTSBURGH • ROCHESTER • ROCKFORD • ST. LOUIS • SEATTLE • TULSA • WASHINGTON • WORCESTER

ALL-WEATHER FIGHTER: *The U. S. Air Force's new experimental all-weather fighter which was built by Northrup is now undergoing flight tests at the Muroc air base, Muroc, Calif. The twin-jet plane has an extremely thin wing and an unusual tail assembly.*

from Seattle. The bridge will eliminate many miles of ferry travel, including the long run from Edmonds to Port Ludlow, Edmonds to Kingston, and from Seattle to Indianola.

A direct and short ferry ride from Seattle to Winslow on Bainbridge Island will put auto traffic on roads that will lead to the new bridge and the mainland.

The bridge specifications call for a two-lane cantilever structure 1229 ft long, 75 ft above high water (tide) and with a center 540 ft long. Estimated cost is between $750,000 and $1.5 million.

SALT LAKE CITY—Already extensive explorations for oil in Utah will be stimulated by the bringing in of two small wells at widely separated points. The Equity Oil Co. hit the first commercial producer eight miles east of Vernal, presumably an extension of the Rangely, Colo. field. It started at 350 barrels per day and settled down to 150.

Last week the California Co. brought in a wildcat well with a production of about 192 barrels per day 12 miles southwest of Escalante in Garfield County, Utah.

The two wells are approximately 225 miles apart and most of the area in between is being explored or leased preparatory to exploration. One major difficulty of the wildcatters is getting casing.

Discusses Clad Steels At Los Angeles Meeting

Los Angeles

• • • **Dr. W. G. Theisinger,** manager, Sales Development of Lukens Steel Co. and its divisions, By-Products Steel Co. and Lukenweld, was recently the guest speaker at the September meeting of the Los Angeles Section, American Welding Society which was held in Los Angeles on Thursday evening, Sept. 16. The Long Beach Section of the society were guests at this meeting.

"The Manufacture, Fabrication and Application of Clad Steels" was the topic of Dr. Theisinger's address, which was supplemented by a showing of the full-color motion picture, "The Manufacture of Clad Steels," and with slides showing approved methods of welding and fabricating.

Clad Steels are a development of the Lukens Steel Co. and the International Nickel Co. in which corrosion-resistant nickel, Inconel, Monel or stainless steel is bonded permanently and uniformly to a backing plate of ordinary steel.

Dr. Theisinger, who is considered an authority on arc-welding and fabricating of steel plate, is a graduate of Harvard University.

Leases WAA Facilities

Spokane, Wash.

• • • **The Chromium Mining & Smelting Corp.** has leased from War Assets Administration facilities in the Mead war magnesium plant for the production of ferrochrome-silicon. This product will be offered for sale to steel plants in the far West and also shipped to the company's new mixing plant at Riverdale, Ill.

About 30 of the 432 furnaces at the Mead plant are to be devoted to reduction of zinc from ore concentrates supplied by the Pend Oreille Mines & Metal Co. through a mill to be built by Reeves-McDonald Mines Ltd.

Applies For $8.71 Rate

San Francisco

• • • **Application** has been filed with Pacific Freight Traffic Bureau by Columbia Steel Co. for a rate of $8.71 per gross ton for cold reduction break-downs shipped from Geneva, Utah, to Pittsburgh, Calif.

It is now probable that additional finishing rolls will be installed at Geneva so that shipment of strip for the new sheet and tin plate mill can start by next January.

Opening ceremonies for the new mill at Pittsburgh have been set for Oct. 21, in the presence of chief executives and directors of the U. S. State Steel Corp. Strip for the first months of operation will come from Fairfield, Ala., and from Pennsylvania and Ohio points.

Permanente Shows Profit

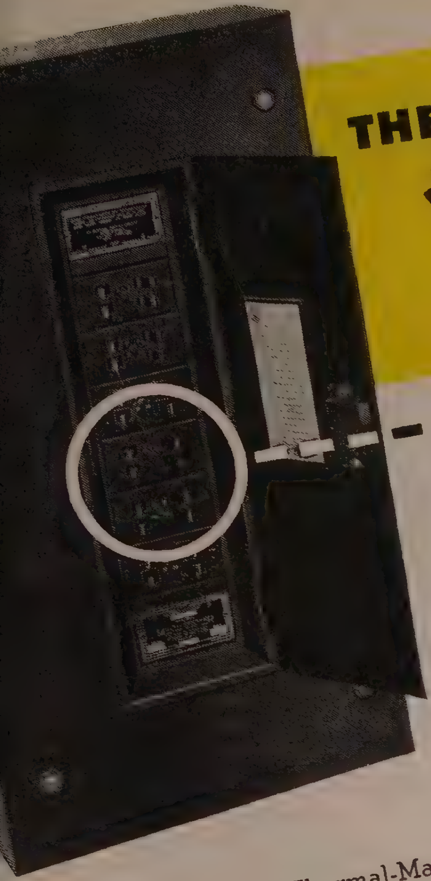
Oakland, Calif.

• • • **Total** sales of $69,605,000 and current net earning rate of $1 million per month are reported by the Permanente Metals Corp., claiming current production of 20 pct of the nation's primary aluminum.

The company's two aluminum reduction plants at Tacoma and Spokane, Wash., have a capacity of 257,500,000 lbs of aluminum annually and last year produced 248,962,550 lbs. In addition to the reduction plants and the rolling mill at Spokane the company's facilities include chemical and refractory operations, a soda-ash plant at Owens Lake and a bauxite ore processing plant at Baton Rouge, La. Net profit for the year was $10,975,000.

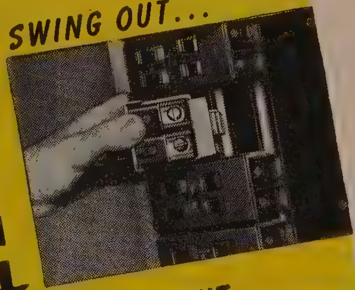
The company now employs 5000 persons and is preparing to enter the aluminum wire and cable field and also the supply of aluminum foil.

THE NEW NMO "PLUG-IN" PANELBOARD

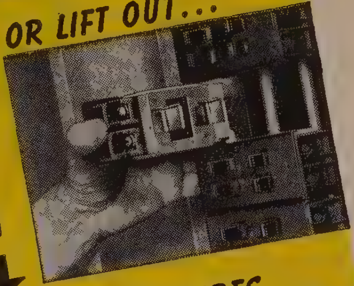


- ✓ Easy to Wire
- ✓ Simple to Add or Change Circuits
- ✓ Smaller—Yet More Gutter Space
- ✓ New Thermal-Magnetic (Coilless) Multi-breaker Units
- ✓ Application—wherever large number of branch circuits for lights, appliances and business machines must be switched and protected.

① SWING OUT...



② OR LIFT OUT...



③ ATTACH WIRES...

④ "PLUG-IN"

Compact, 4-circuit Thermal-Magnetic (Coilless) Multi-breaker units, equipped with positive-pressure contact jaws, grip cylindrical silvered bus bars.

"Plug-in" feature permits easy removal and insertion of units for future changes in circuit ratings or additional circuits if space for expansion is planned.

Low heating, permitting small size, is achieved by exceptionally high silver content in breaker unit contacts, and elimination of bolted current carrying connections.

Smaller size greatly improves utilization of wall and column space. Yet panel has more gutter space (5½" in 15" box) because of compact Multi-breaker unit. Narrow column type has twice number of circuits previously available in cabinets of similar height.

NMO panelboards are furnished with 100 and 200 ampere mains, 120/240 Volt A.C. with 15, 20 and 30 ampere single and double-pole branch circuits.

THERMAL-^Coilless MAGNETIC MULTI-BREAKER UNIT PROVIDES 2-WAY CIRCUIT PROTECTION

1. Thermal trip element holds harmless momentary overloads but trips if overload continues.
2. Magnetic element functions instantly on both moderate and heavy "shorts."

ILLUSTRATED NMO *Bulletin* gives complete information on the new Panelboards. Address Square D Company, 6060 Rivard St., Detroit 11, Michigan.

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PERSONALS

• **Samuel M. Gahagen,** formerly of the Rustless Iron & Steel Corp., Baltimore, has been appointed chief metallurgist by the Jessop Steel Co., Washington, Pa. Mr. Gahagen has formerly been associated with American Steel & Wire Co., Crucible Steel Co. and the Vanadium Corp.

• **J. A. O'Hare,** sales manager of chemical lead products, and **R. R. Stamm,** manager of metal sales for the company's St. Louis branch, has been appointed to the metal sales committee of the National Lead Co., New York. Mr. Stamm replaces **G. W. Worrall,** St. Louis branch manager, on the committee.

• **Roland C. Disney** has been elected vice-president and general manager of the Whitcomb Locomotive Co., Philadelphia, a wholly-owned subsidiary of the Baldwin Locomotive Works. Mr. Disney has been associated with Baldwin as assistant to the vice-president of the Eddystone Div.

• **Franklin R. McNeeley** has been appointed sales promotion manager at The Home Store in Dayton. Mr. McNeeley comes to The Home Store from Adler and Childs organization.

• **Karl S. Howard,** vice-president of General Steel Castings Corp., has been named a director of the Main Belting Co., Philadelphia.

• **Robert A. Stauffer** has been appointed assistant director of research of National Research Corp., Cambridge, Mass. **James H. Moore** has been promoted to director of the Metals Dept., succeeding Mr. Stauffer.

• **Kenneth W. Short** has been appointed purchasing agent for Monsanto Chemical Co.'s Plastics Div. in St. Louis, succeeding **Glenn M. Bullard,** who has retired. Mr. Short has been senior buyer for the division since 1942 and was recently appointed assistant purchasing agent.

• **Eugene C. Hamilton** has been made manager of the newly-combined Air Conditioning & Refrigeration Distributor Service Dept. and the Air Conditioning & Refrigeration Sales Div., Worthington Pump & Machinery Corp., with headquarters at Holyoke, Mass.

CARL J. LAMB, consulting engineer, Hydraulic Press Mfg. Co.

• **Carl J. Lamb** has been appointed consulting engineer, Hydraulic Press Mfg. Co., Mount Gilead, Ohio. Prior to coming to H-P-M, Mr. Lamb served as head of the eastern office of a firm of consulting engineers in machinery and equipment design.

• **W. F. Godejohn** had been appointed assistant to the president of Harbison-Walker Refractories Co., Pittsburgh. **Hugo L. Harrod** has been promoted to district superintendent of the Missouri Works. **George M. Ullom** has been named district sales manager at Portsmouth, Ohio, and **R. B. Jenner** has been appointed head of the refractory plastics and castables division.

• **William C. Wheeler** has been appointed assistant to the chief engineer of the St. Louis Car Co. in St. Louis.

• **Marshall G. Munce** has been elected a vice-president of York Corp., York, Pa. Mr. Munce joined the organization in 1921 and since 1940 he has been assistant to the president, chiefly as coordinator between the engineering, manufacturing and sales divisions, which activities have been taken over by **J. Keith Louden.** Mr. Louden has formerly been associated with Armstrong Cork Co.

• **G. O. Romig** has been appointed sales manager of the Cleveland plant of Claud S. Gordon Co., Chicago. Mr. Romig joined the company as sales engineer in 1945.

• **A. W. Robertson, Gwilym A. Price** and **L. B. Osborne,** chairman of the board, president and senior operating vice-president, respectively, of Westinghouse Electric Corp., have been elected to the board of directors of the Baldwin Locomotive Works, Philadelphia. **James R. Weaver** has been elected vice-president in charge of manufacturing, Eddystone Div., Baldwin Works. **John S. Newton** has been named vice-president in charge of engineering, Eddystone Div.

• **G. A. Gilbertson** has joined the Frank G. Hough Co., Libertyville, Ill., as vice-president. Mr. Gilbertson recently resigned as assistant sales manager of the Industrial Power Div. of International Harvester Co.

• **John W. Butler** has been named manager of the Commercial Engineering divisions; **C. E. Sutton, Jr.,** assistant manager, Power Transformer Sales Div., and **C. W. Lamplough,** manager, Order Service Div., General Electric Co., Schenectady.

• **D. A. Currie** has been reelected president and treasurer; **F. F. Clark,** honorary vice-president; **James A. Currie,** first vice-president; **Robert N. Yates,** second vice-president, and **C. D. Pinney,** secretary, Erie Foundry Co., Erie, Pa.

• **M. J. Danneker** has been appointed supervisor of the employment department at Midland Works, Crucible Steel Co. of America, Pittsburgh. Mr. Danneker has previously been employed in the industrial relations department at the Midland Works.

• **William H. Oliver,** acting superintendent of the iron department of the American Radiator & Standard Sanitary Corp.'s Louisville works, has been appointed general superintendent of the corporation's Bond plant in Buffalo.

• **Kenneth M. Smith** has been named assistant to the vice-president in charge of sales of the National Malleable & Steel Castings Co., Cleveland.

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STOKERS • SCALES • MOTORS • GENERATORS
PUMPS • FARM EQUIPMENT • MAGNETOS
RAILROAD MOTOR CARS and STANDPIPES

• **Sherman M. Fairchild** has been named president, **Wentworth Fling,** operating vice-president; **Jay H. Quinn,** director of sales and advertising; **C. V. Kettering,** sales division head specializing in educational and industrial applications; **Theodore Lindenberg,** instrument laboratory head; **Gordon Mercer,** in charge of the electronic laboratory, and **John B. Wolf,** secretary-treasurer of the newly-formed Fairchild Recording Equipment Corp., New York. **Dr. D. G. C. Hare** has been retained as technical consultant and adviser.

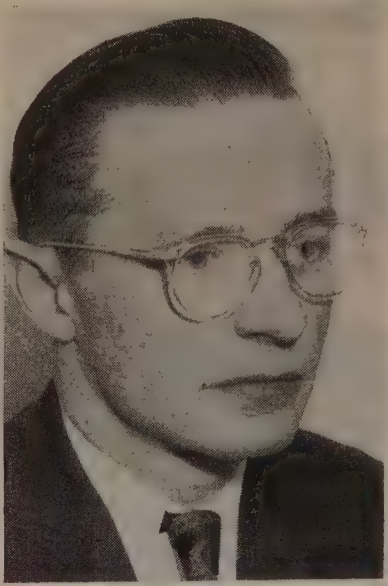
• **Dr. David M. Gans** has been appointed director of research, the Arco Co., Cleveland. Dr. Gans was formerly technical director of the Quaker Chemical Products Corp.

• **Paul Brainard,** formerly assistant supervisor of hoist design for the Hyster Co., has been named head of the newly-created Engineering Standards Dept. **William Morrow,** formerly purchasing agent at the Danville, Ill., plant, has been appointed chief accountant for the Portland, Ore., office. **R. E. Stiegele,** formerly district representative, has been transferred to the General Sales Dept. in Portland, Ore., to handle special sales assignments for the general sales manager. **W. R. Hunt** succeeds Mr. Stiegele in the southeastern territory.

• **Louis E. Rau** has been named to head the new Buffalo branch of the Crocker-Wheeler Electric Mfg. Co., Division of the Joshua Hendy Corp., Ampere, N. J. Mr. Rau comes to Buffalo after several years on the staff of the New York district office.

• **Edmund B. Kinne** has been appointed product engineer of the McConway & Torley Corp., Pittsburgh. Mr. Kinne joined the company in 1943 and has served as production engineer and as assistant to the general superintendent prior to his new appointment.

• **Henry J. Howlett,** secretary of the American Management Association, has resigned from that group to become president of Container Laboratories, Inc., New York. Mr. Howlett succeeds the late **E. A. Throckmorton, Jr.**


O. R. SCHROEDER, vice-president, Weldaloy Products Co.

• **O. R. Schroeder** has been named vice-president of development and engineering of the Weldaloy Products Co., Detroit. Mr. Schroeder formerly served as a director of metallurgical research for the Great Lakes Steel Corp.

• **Robert M. Honegger,** general manager of the Buffalo plant of the Farrel-Birmingham Co., Inc., has been elected a director of the company.

• **H. C. Weidner** has retired as president of the Townsend Co., New Brighton, Pa., and has been elected chairman of the board of directors. **Frederick R. Dickenson** has been elected president and **Joseph S. Thompson** has been appointed general sales manager. Mr. Weidner joined the company in 1913 and has been president since 1928. Mr. Dickenson joined the company in 1947 as executive vice-president. Mr. Thompson joined the company earlier this year as assistant to the executive vice-president.

• **Edward C. Fales,** executive vice-president, American Welding & Mfg. Co., Warren, Ohio, has been elected a director of the company.

• **F. W. Anderson** has been appointed sole sales representative in the Illinois and Wisconsin territory for Merit Products Inc., Los Angeles. Mr. Anderson has offices in Chicago and Racine.

• **Wilbur H. Norton** has joined the staff of the General Motors Corp., Detroit, working on special assignments and reporting directly to the president. Mr. Norton was formerly president of Montgomery Ward & Co.

• **Edward C. Bloomberg** has been elected executive vice-president of Monarch Aluminum Mfg. Co., Cleveland. Mr. Bloomberg was named treasurer of the company in 1947 and carries on the responsibilities of both offices.

• **Fred B. Riggan,** formerly chief metallurgist, has been promoted to foundry manager and general superintendent of the Key Co., East St. Louis, Ill. **Arnold Czechowicz** has been appointed assistant foundry superintendent and **Robert Jacoby** has been advanced to the position of chief metallurgist.

• **C. P. Corrigan** has been appointed district sales manager for the Cleveland area of the Ramapo Ajax Div., American Brake Shoe Co. Since joining Brake Shoe in 1939, Mr. Corrigan has held several positions in the sales and purchasing departments of the company.

• **Roy S. Rankin** has resigned as vice-president and director of sales of Harris Calorific Sales, Inc., and has been appointed manager of Progressive Welder Sales Co. of Michigan in Detroit.

• **Fred D. Wilson** has assumed his duties as assistant to the president of Bendix Home Appliances, Inc., South Bend., Ind. Mr. Wilson has been vice-president in charge of operations for Radio Corp. of America, RCA Victor division, since 1947.

• **E. B. Forse,** manager of the refractories division of the Carborundum Co. at Perth Amboy, has been appointed assistant vice-president. **C. E. Hawke** has been named manager of the refractories division. **E. R. Baxter** has been named director of sales and sales administration. **G. R. Rayner, Jr.,** has been appointed assistant director of sales administration.

• **Richard Rieger** has joined the Chicago office of Yale & Towne Mfg. Co., Philadelphia Div., as branch service manager.

H. Robert Miller has been ap- ointed assistant director of sales f the White Metal Mfg. Co., Ho- oken, N. J. Mr. Miller was for- erly associated with McKesson Robbins in the Chemical Div.

Will Whitmore, advertising man- ger of Western Electric Co. Inc., ew York, since 1945, has been ppointed radio advertising man- ger of the American Telephone & elegraph Co., New York. **W. M. eynolds** has been named to suc- eed Mr. Whitmore at Western lectric.

Burleigh Owens has taken over e management of the Chicago ranch of E. C. Atkins & Co., In- ianapolis. Mr. Owens joined the mpany in 1921.

J. C. Kuhn has been named gen- ral sales manager, Morse Twist rill & Machine Co., New Bedford, ass., succeeding **Mort Rainey** ho has resigned as vice-president d sales manager to pursue other terests. **A. L. Carr** has been ap- inted sales manager. Mr. Carr rmerly served as assistant sales anager and has been with the orse organization for 32 years.

S. DeVries has been appointed clusive sales representative in e state of Connecticut for the w line of material handling uipment for George Haiss Mfg. . Inc., New York. Mr. DeVries located at Milldale.

James H. Karlet has been ected president, and **Julian M. ratze** secretary and treasurer of olverine Steel Co., Detroit. Both en have been associated as vice- esident and general manager d secretary-treasurer, respec- vely, with the Todd Steel Co.

M. P. WINTHER, vice-president and director of engineering, Eaton Mfg. Co.

- **M. P. Winther** has been appointed vice-president and director of engineering, Eaton Mfg. Co., Cleveland. Mr. Winther has been associated with Eaton since 1946 when the company acquired the Dynamatic Corp. of Kenosha, Wis., of which he is president. He also serves as a director of the Eaton Co.

- **C. R. Fischer** has been named sales representative in the eastern half of Pennsylvania and New Jersey for the Geo. P. Reintjes Co., Kansas City, Mo.

- **Charles B. Culbert, Jr.** is now permanently located in the Boston area as representative for the Arcos Corp. of Philadelphia, maintaining offices in Natick, Mass.

- **E. B. White** has been named representative of the Plasteel Products Co., Washington, Pa., covering the Kansas City and adjacent territory, with his headquarters in Kansas City, Mo. Mr. White was formerly associated with the Eutectic Welding Alloys Co.

- **Willis C. Toner** has been appointed plant manager of the new television tube plant of Sylvania Electric Products, Inc., at Ottawa, Ohio. Mr. Toner has been associated with Sylvania's radio division plants since 1930. **Henry A. Bair,** formerly general foreman, has been appointed manufacturing superintendent of the Cathode Ray Dept., at Emporium, Pa. Mr. Bair has been with the company since 1927 and in cathode ray tube activities since 1936.

- **J. P. Lally,** president of C. G. Hussey & Co., Pittsburgh, has been elected a director of the Monongahela Connecting R. R. Co., a carrier of Jones & Laughlin Steel Corp., operating in the Pittsburgh district.

- **John R. Marvin** of John R. Marvin & Co., Philadelphia, has been appointed eastern representative for the Sterling Mfg. Co., Cleveland, his territory including all of eastern Pennsylvania, including Altoona and southern New Jersey.

- **E. H. Mebs,** formerly division superintendent (foundries), Johnstown-Lorain Works, Carnegie-Illinois Corp., has been appointed to the newly-created position of works manager, the Machined Steel Casting Co., Alliance, Ohio.

(CONTINUED ON P. 176)

OBITUARY...

David Strauss, 80, chairman of e board, Continental Iron & eel Co., New York, died Sept. 28.

Newman Ebersole, director of rchases of Armco Steel Corp., iddletown, Ohio, died recently.

Kirke R. Wilson, 59, Buffalo in- strialist, died Sept. 25.

James P. Doyle, 71, former as- stant superintendent of blast rnaces at Emsley Steel Works, ennessee Coal Iron & Railroad ., Birmingham, died Sept. 24.

- **A. T. DeForest,** 85, retired former president of Columbia Steel Corp., died recently.

- **Thomas E. Dwyer,** 50, president, Lead Lined Iron Pipe Co., Wakefield, Mass., died Sept. 6.

- **Egbert B. Lane,** 56, New England manager, American Radiator Corp., Boston, died Sept. 17.

- **Harry H. Barber,** 70, chairman and former president of Barber-Greene Co., Chicago, died recently.

- **Charles A. Burckhardt,** 79, president, Lake Washington Shipyards, died recently in Seattle.

- **Samuel Diamond,** president, Continental Iron & Metal Co., Chicago, died recently.

- **Dr. Peter C. Cornell,** 83, first treasurer and an organizer of Trico Products Corp., Buffalo, died Sept. 24.

European Letter . . .

• World finance wizards of International Monetary Fund and International Bank for Reconstruction and Development meet in Washington . . . Unduly inflated boards and staffs aggravate dominant problem . . . Budget curtailment advocated.

LONDON—These Bretton Woods twins have had 2½ years in which to thrive and show their mettle since their baptismal feast—the inaugural meeting of governors at Savannah in March, 1946. To assess their performance, it is well to recall this earlier gathering, at which the fundamental issues that were to determine the character of the two institutions, were decided. The most important of these issues concerned the basic character of the Bank and Fund; whether they were to be political or technical institutions; whether they were to provide a meeting place for bankers or for representatives of governments; whether each was to be managed by an international staff owing allegiance to an international institution alone, or by a large concourse of executive directors and their alternates sitting in permanent session and owing allegiance primarily to the governments which appointed or elected them. This last choice involved two issues; first, the siting of the Bank and Fund, whether they were to be in the political or financial capital of the United States (the fact that they should be in the United States at all had been decided earlier, at Bretton Woods itself); the second concerned the powers and incidentally the salaries to be given to the executive directors and their alternates.

The first British Governor, Lord Keynes, felt deeply on these issues and with all the concern of a man who could rightly claim the major share in the paternity of the twins. It is instructive to recall the speech he made at the inaugural session of the Savannah meeting. In this he invoked all the qualities that the good fairies should be bringing to the two infants, at this, their christening; but he added that if by ill chance some bad fairy had not been invited it would lay a curse on the twins: "You two brats shall grow up politicians; your every thought and act shall have an *arrière pensèe;* everything you determine shall not be for its own sake or on its own merits but because of something else." And Lord Keynes added that if this were to happen "the best that could befall would be for these children to fall into an eternal slumber, never to waken or be heard of again in the courts and markets of mankind."

THIS danger of the intrusion of politics must be more particularly present with the Fund whose concern is primarily with monetary policy, a jealously guarded preserve of national sovereignty. Looking back at the history of the Fund over the past year it cannot be said that it has altogether escaped the curse. The siting of the Fund in Washington has inevitably tended to make that institution an organ of the U. S. Government and its American executive director an agent of the National Advisory Council, the financial committee of the U. S.

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As for the International Bank, the past year has seen a gradual reduction in the tempo of its activities. The first hopes that it might play some part in the European Recovery Program have been disappointed; it stands outside the main channel through which American capital is now flowing to other countries. It is perhaps inevitable that the Bank should have to take a back seat in international investment, since the international demand for new capital is almost exclusively for dollars and the Bank's dollar resources are severely limited. It collected about $750 million in dollar subscriptions from the United States and other member countries. In addition it mobilized another $250 million by last year's issue of bonds in the American capital market. It has to date made loans of slightly over $500 million. Since its dollar resources cannot be allowed to run down completely, the remaining scope for dollar loans is modest and will so remain unless Wall Street can be induced to absorb another issue of the Bank's bonds. There is very little prospect of this at the moment. The Bank has undertaken one or two minor non-dollar operations, such as providing a few Belgian francs for Luxemburg and Swiss francs for the Netherlands, but these are abnormal transactions and given the comparatively expensive terms on which they were made are unlikely to provide precedents. For the time being the role of the Bank appears to be to offer modest prospects of dollar loans for Latin-American countries, thus helping to console these for the major direction of U. S. external assistance towards ERP.

While the operations of both Bank and Fund have been slowing down, the same cannot be claimed for the scale on which these two institutions live and provide livings. For the fiscal year to June 30, 1948, the Bank had an administrative budget of over $4,000,000—an outrageously high figure in relation to the actual business done. When the accounts of the Fund for the past year are published this sum will probably be shown to have been exceeded by that institution. The worst fears of those who looked askance at the grandiose scale on which these two institutions were launched are now being realized. The staffs of each appear to be out of keeping with the volume of business which is being transacted. The Boards of Executive Directors with their fourteen full-time directors and fourteen alternates, all of them drawing large tax-free salaries, with quite inadequate work to occupy more than a small fraction of their time, must tend to become lush and convenient pastures where govern-

(CONTINUED ON PAGE 161)

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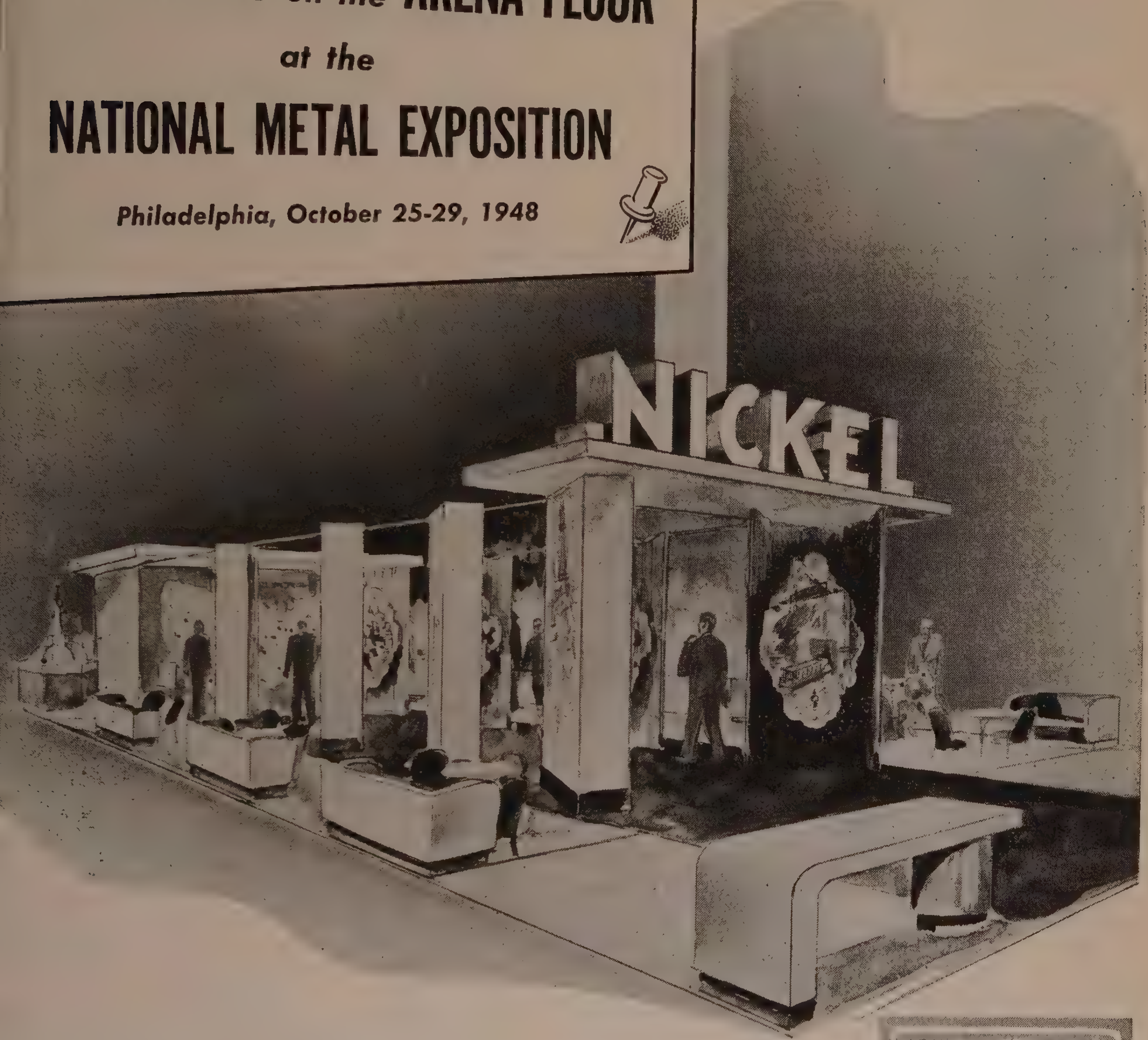

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Industrial News Summary...

- ***Future Scrap Outlook Dim***
- ***Easiness Only Temporary***
- ***1949 Will Be Tough Year***

THERE will be a scrap shortage this winter. And there will be a greater scrap shortage next year. But for the time being the seriousness of the long term outlook is veiled by a temporary surcease from worry.

Were scrap plentiful, more steel would be made each week. More steel has been made recently because shipments of steelmaking scrap have been heavier. Also scrap coming from Germany, while not large quantities, has given some buoyancy to steel makers' hopes.

But what interests steel people is that present scrap prices will probably stay in suspended animation for some months at least. Talk of lower prices in the trade is currently without foundation. Talk of higher prices lacks factual support.

Reasons why the price of steelmaking scrap will not go down much, if any, in months to come are; (1) long term shortage is still with us, (2) steel firms need every ton of srap they can lay their hands on, (3) increased price of pig iron tends to support scrap prices and (4) greater use of scrap by electric furnaces.

Reasons why the price is not expected to move up to any great extent in the months to come are; (1) better inventories at the mills, (2) better shipments to mills with less time lags, (3) the knowledge that a few more bucks won't bring out any more scrap from hiding places—if any and (4) prospects of more German scrap coming in.

The factor which could upset everything on scrap, however, would be a rise in the price of steel. It is doubtful if any major steel price changes will take place this fall. But if a boost would come the price of scrap would also go up—it always has after a steel price rise.

NO steel company is getting all the scrap it wants or could use. There is little chance that such a Utopia will come at all—or, if it does, that it will come when it would do much good. But the scrap market seems to be settling into a groove. Circus tactics are at an end. Both buyers and sellers are glad of this. Some of the trials and tribulations of scrap sellers and buyers would read like a Buck Rogers story.

The slight feeling of expansiveness in the scrap trade is deceptive. Prices may be stabilized and supplies may be a little better than expected but it is an ominous satisfaction. When more capacity comes in late this year—and more next year—demand for scrap will be heavier than ever. And the increase in the amount of carbon steel to be made in the electric furnace alone will mean less available scrap.

Openhearth steel practice usually takes a half to of steel scrap and a half ton of pig iron to make a to of steel. But the electric furnaces take a ton of scra to make a ton of steel. The more electric steel mad the less is the potential supply for openhearths—ove the long pull.

The increase in the price of pig iron made by a major producer a couple weeks ago is being followed b producers in other areas. Raises have averaged $3 ton. Mounting costs have been plaguing blast furnac operators for some time.

Only when the last dog was hung were the advance made, say those who upped the price. But, even thi week, prices at the blast furnace on regular pig iro (not premium priced material) may be inadequate i the freight rate boosts asked for on coal and ore finall go through.

DESPITE the pig iron increase announced—an maybe more to come—the iron is still selling fo less than the cast iron scrap it replaces. Even at it new all-time high of $46.07, it is almost $50 a to less than some foundries have been forced to pay fo imported iron. Iron-hungry foundrymen have als been paying as much as $20 a ton in freight to mov pig iron from distant domestic furnaces.

Users of cast iron scrap had thought they were ove the hump on prices for that material. They had reaso to hope that this was true. Many of them have bee paying from $60 to $70 a ton delivered. In recent week it looked as if they might get a break. Higher pig iro prices at the blast furnaces may have nipped thos hopes.

Recent remarks coming out of Detroit about th shortage of steel are not regarded as sour grapes. Mos automotive heads try every way possible to get mor steel. They know what the problems are for more ca pacity. Some of them feel that the industry was caugh short by the unusual demand and should have bee better prepared for it. But Detroit industrialists wan more steel instead of debating why they don't hav more. That is why they are using conversion plans t the hilt.

Installations under way at Kaiser's Fontana ste plant will mean that more than 1 million tons of ste capacity will soon be available there. Finished ste additions since the mill has been built have been su stantial. There is no doubt that this West Coast plan which got the razzberries at first, is here to stay.

Steel ingot output this week is up a point to 97.5 p of capacity. This is the highest rate of operation achieved since before the coal strike, surpassing th previous record of a week ago.

RESIGNED—Resignation of Tom Smith Jr., president ssed Metal Institute and spokesman of the steel stamp- industry, was announced this week by Walter A. Gor- PMI vice president, who has taken over Mr. Smith's ies temporarily. In a bulletn to PMI members, Mr. rell stated that "it is with deep regret that I announce resignation of Tom J. Smith Jr. as president of Pressed tal Institute. Until such time as the vacancy created Mr. Smith's resignation has been filled and the contin- g program of PMI formalized, the administration will directed by the vice president with the advice and guid- e of the executive committee."

ONE ANSWER—Melting low carbon steel in electric naces will be the answer of several progressive steel- kers to their semifinished steel supply problems. These naces will help immensely in meeting the nation's steel ds, in leveling out employment in many steel consum- industries. But they require a ton of steel to make a of steel. As an answer to pressing steel demand se new electric furnaces are quick and practical. But h expansion can not be carried out indefinitely. As ply comes into balance with demand some electric fur- e capacity may be taken out of operation.

BUYS FABRICATOR—A substantial stock interest in iser Fleetwing, Inc., Bristol, Pa., has been purchased Sears, Roebuck & Co. According to T. V. Houser, rchandising vice president of Sears, Roebuck & Co., the stol plant will be expanded early in November for the duction of sinks, bathtubs, lavatories and sink cabinets supplement present sources of supply for these fixtures.

MOVING IN—Shop equipment began arriving in Keesport, Pa., this week for the Kelsey-Hayes Wheel plant, the first large fabricator to move to the Pitts- rgh district since the advent of F. O. B. steel sales. iginal plans were for Jones & Laughlin Steel Corp., ginal owner of the plant, to retain part of the facilities fabricate river barges and mine cars until July 1949. wever, Kelsey-Hayes will now take over the whole plant l finish up the J & L car and barge orders. K-H pects to employ about 1500 at the plant.

• **PRICING HEARINGS**—The Senate's Capehart subcommittee on trade policies will open public hearings in Washington, beginning Nov. 9. Early sessions will be confined to witnesses from Federal Trade Commission and buyers and sellers of steel, cement, and sugar. The group is investigating effect of f. o. b. pricing on the consuming public.

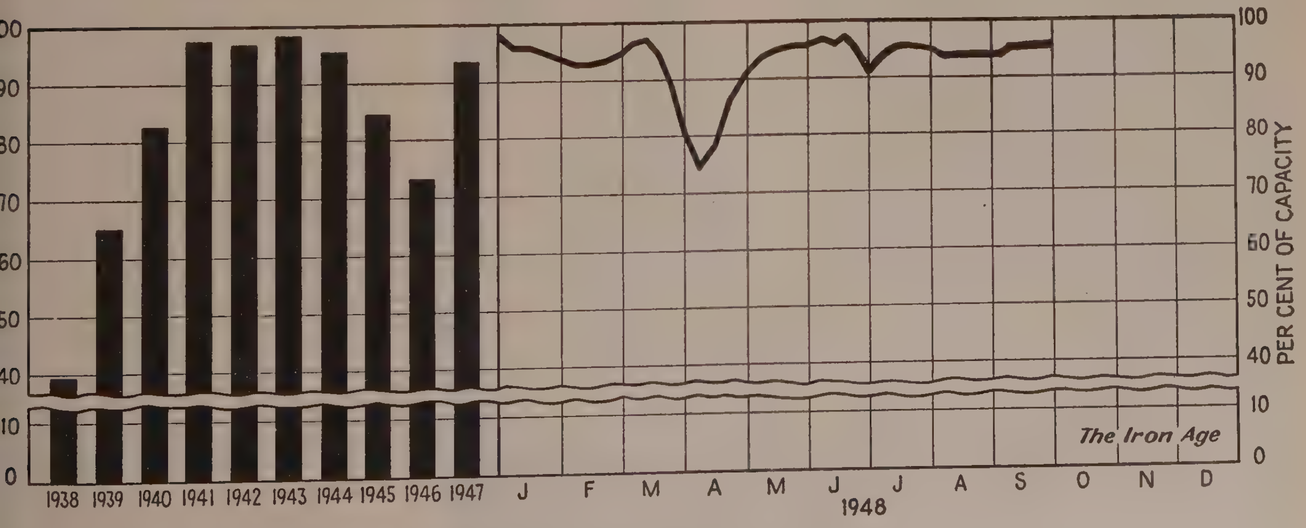
• **PIG IRON UP**—Pig iron price increases have been made by U. S. Steel Corp., Youngstown Sheet & Tube Co. and Interlakes Steel Co. effective last week. The hike in prices for each of the companies averaged $3 a ton. Bethlehem Steel Co. raised pig iron prices $4 a ton previously.

• **SEEKING HELP**—Members of the Independent Petroleum Assn. of America attending the 19th annual meeting at San Antonio, Tex., adopted a program in which they will ask the Dept. of Commerce for a voluntary allocation program to meet their needs for domestic pipe. In addition to straight voluntary allocation of sufficient steel to maintain operations of all pipe making facilities at full capacity, the group is advocating voluntary methods of sale and distribution that will eradicate gray markets. Members of the meeting went on record in favor of export control laws to assure the essential needs of domestic industry be recognized and filled before export demand for items made out of steel are taken care of.

• **UPS AND DOWNS**—While production of building materials as a whole showed new gains during July, a few, mostly in the metals field, showed new lows for the year. Included in the decreased productions were fabricated structural steel, cast iron pipes and fittings, and nails, according to Commerce Dept. figures. Production of concrete reinforcing bars were among the 11 major items showing increase.

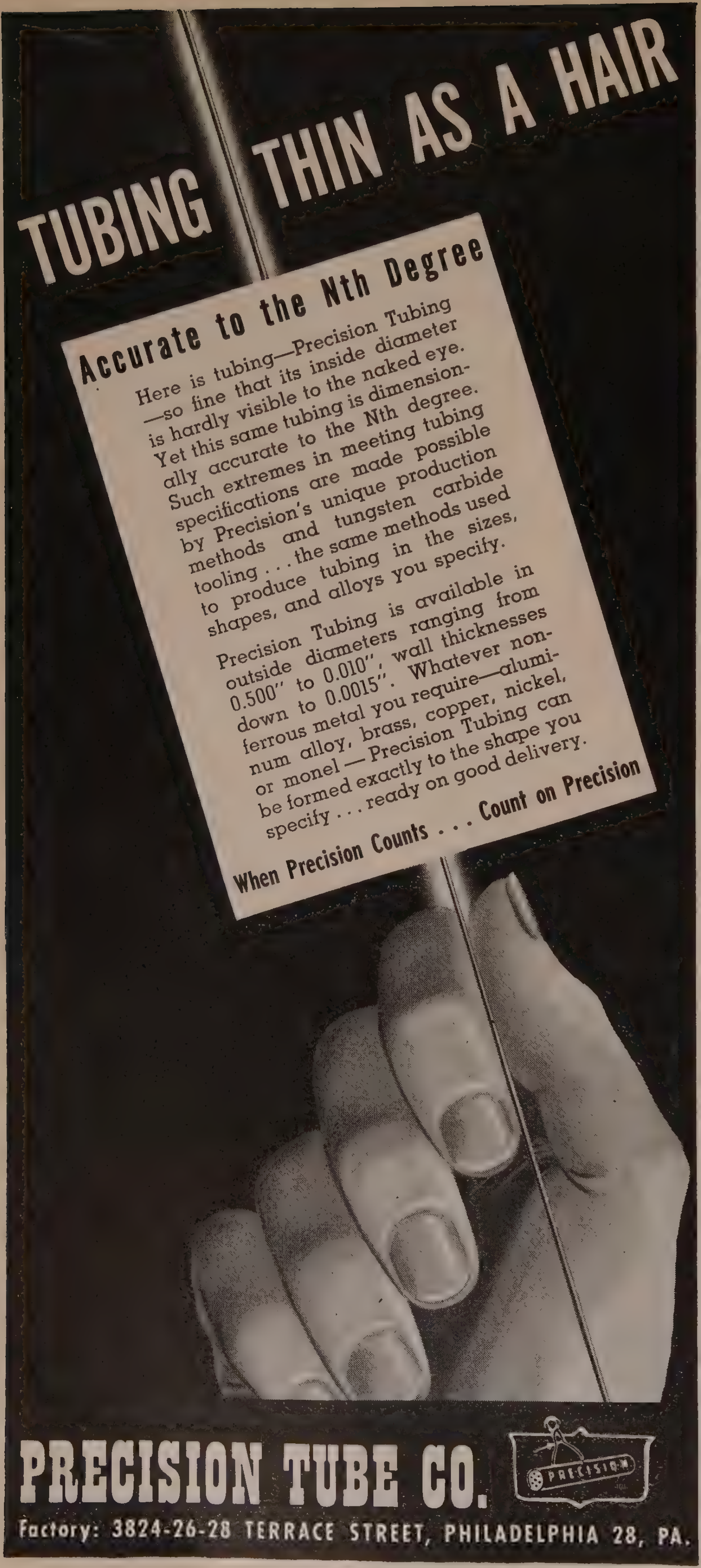
• **GROWING, GROWING**—American business expects to pay out nearly $5 billion for new plants and equipment during the last 3 months of 1948, according to government estimates. This would bring the total for the year close to $19 billion. A substantial portion of the manufacturing expenditures is going into new and replacement equipment since industrial construction has declined steadily all year. On the other hand, commercial building such as stores, warehouses, etc., continues on the increase.

Steel Ingot Production by Districts and Per Cent of Capacity



Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
. 28........	98.0	99.0*	92.0	87.0	96.5*	105.0	100.0	102.0	102.5*	84.0	103.0*	91.5	112.0	96.5
5........	99.0	97.5	93.0	87.0	96.0	105.0	96.0	102.0	102.0	90.0	107.0	91.5	112.0	97.5

* Revised.



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TOOLING METHODS FOR ACCURATE TUBING

The days of considering accuracy as an art are definitely over. Accuracy has passed from a fickle result of the artisan's skill, to a predictable, controllable result of repetitive production and proper tooling. Modern assembly methods demand component parts with complete interchangeability. The principal advances have been in tooling, annealing, lubrication, gauging, and the use of statistical methods of quality control. This discussion is concerned with tooling.

In operations at the Precision Tube Company, we have found that tungsten carbide dies are best for cold drawing non-ferrous metals. This is true for all sizes except the very smallest, where diamond dies are still used. In general, dies above 0.050″ in diameter are tungsten carbide, and below 0.050″ are diamond.

Die maintenance is a major problem. We here at Precision do our own die finishing. Suspended boron carbide in a mineral vehicle is used for rough grinding in a machine, and diamond powder is used for final polishing by hand. Dies which need refinishing are made over into substantially larger sizes.

For drawing over a stationary inside tool or plug, tungsten carbide materials are most satisfactory. These are finished to size by grinding with diamond wheels and hand polishing with diamond dust. A complete check of tool wear and maintenance practice, and constant inspection of finished material, have proved that this is sound practice.

Thus, wherever it can be used, tungsten carbide tools have been found to offer the greatest resistance to wear in producing accurate tubing economically. But even tungsten carbide must be given proper lubrication attention, for high accuracy is impossible if tools change from the beginning to the end of a production run. If mineral base lubricants are used, sulphur content is vital. With water soluble lubricants, staining is a major problem. In either case, proper cleansing methods must be devised.

It can be seen, therefore, that in Precision Tubing production, there can be no makeshift tooling practices. Tools must be checked to make certain they are in perfect condition with duplicates ready if needed. There are no short cuts to quality.

(Advertisement)

Circus" Market in Scrap Seems Likely to Stop With Three Rings

High Prices, Phoney Grading and Fantastic Deals Have Characterized Market

° ° °

By D. I. BROWN

Chicago Regional Editor

° ° °

hicago

• • Ever since the end of OPA, oming scrap prices, over and nder grading, fantastic trade eals, etc., have had the industry a constant lather. Everyone ept walking around asking every- ie else "How wacky can the rap market get?" Today the pop- ar term used is "circus market" id it means not so much that to- y's scrap market is so very nny, but rather that anything n happen and usually does.

Two solid years of circus mar- ets have caused even the most ırdy traders their share of ul- rs. Buyers or sellers don't like ıch markets. Dealers, brokers id consumers are together in ieir condemnation of present nditions. That they are all par- ally responsible for what has ppened, they don't deny.

Now for the first time in years ere seems to be good indication at the most hectic circus days e over. Or at worst, they won't ld any more rings to the present ree ring show. It is firmly be- eved here that the trade has ally demonstrated exactly how acky it could get. It amounts $42.00 a gross ton for what is legedly No. 1 heavy melting rap. For good old fashioned o. 1 heavy melting, or the grade day called low phos, low phos, 50.00 was as wacky as they got. hese prices appear to be the high ater mark as far as representa- ve mill prices are concerned.

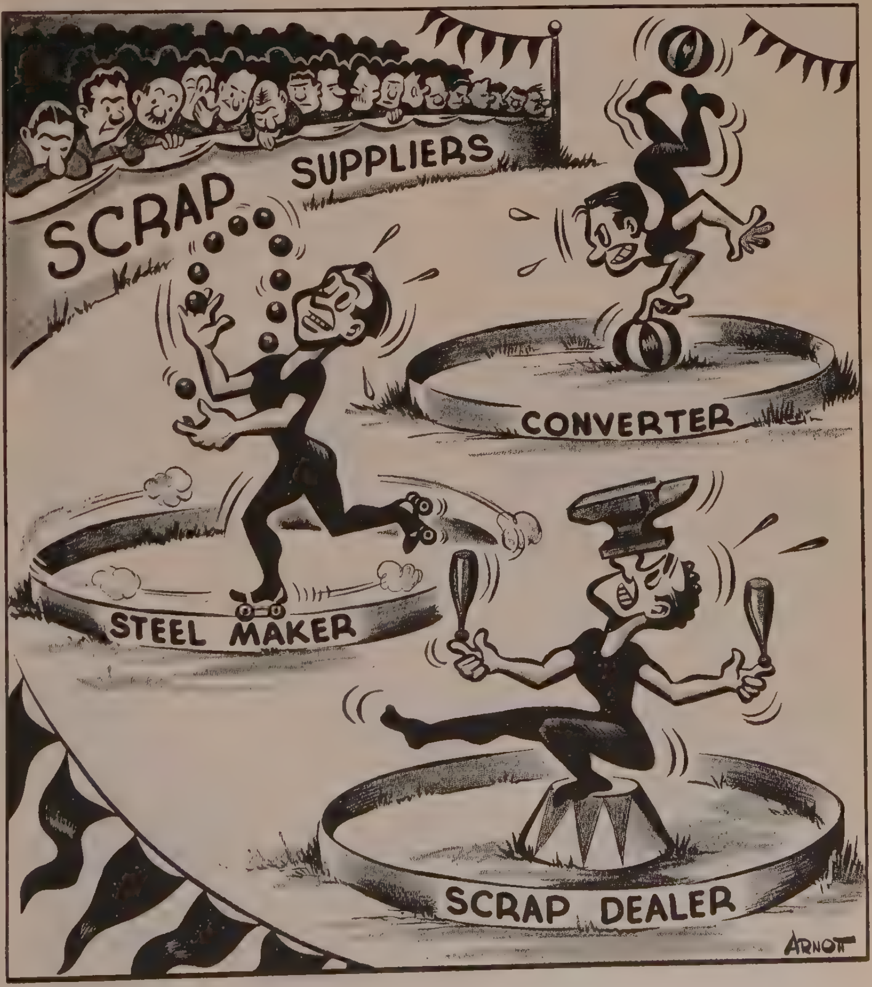
It is the consensus of reliable idustrial men in this area that rap prices paid by the steel ills for regular openhearth rades have reached their peak. rom now on the market won't e so wacky. However, the present emand is such that the present rice level will be with us until eel supply improves, demand ta- ers off, pig iron production in- reases or conversion deals cease.

Conversion is the biggest single ker in the scrap deck. Blue ip companies are in this mar- et up to their necks. They have een forced into conversion and ey can't possibly get out of the arket as long as steel remains in tight supply. Conversion has not only produced two types of steel source, but it is also the reason for the distinct types of scrap market, and therefore, two prices. However, the bulk of scrap bought for conversion is restricted to relatively few types so that not all items have been affected.

Because of conversion, many say, scrap prices can't go down. In fact, should things get tighter this winter some observers here believe that scrap buyers for the conversion deals may force the market above its present "formula" level. If it were not for the fact that the mills have tied up the scrap of their regular customers, many scrapmen believe the market right now would be out of hand. Some mills are getting as high as 60 pct of their purchases of scrap through these earmarked arrangements.

From here on it will be a tug

Atten-Shun, Please



of war on available scrap supplies between regular scrap movements and those moving into straight conversion deals. Many of the larger scrap brokers are in both types of markets. It is believed by reliable scrapmen that the mills will be able to hold the present price level because they are doing the converting of the ingots into other products.

It will be recalled that last winter, when buyers of scrap were bidding high prices for shipments to certain ingot makers, the market went crazy. At that time the mills converting these ingots into slabs and hot bands refused to continue their conversion of ingots from these particular companies until the scrap price bids were lowered. It took a few weeks but the ingot makers finally fell in line. This hammer will be used again if necessary.

Fortunately, conversion scrap as usually specified, must be low phosphorus, low sulfur, low alloy electric furnace type, as the ingot makers will not guarantee a quality of ingots any better than the scrap that goes into the heat. This has meant that often large scrap buyers are buying scrap for 10 different conversion customers, all of whom may be having ingots made in one single shop. Each ingot maker is, therefore, melting ingots, the scrap for which must come out of one particular pile.

This complicates matters. Conversion customers all agree the whole thing has always been complicated, however, and that another single complexity does not worry them. Steel foundries with electric furnaces are mainline sources of conversion ingots. They were from the very start, but now they are increasingly active.

Considerable railroad scrap has been switched from the large mills to the smaller ingot makers sewed up in conversion. Present prices for No. 1 railroad heavy melting attest to the fact that the regular mills have been consistently outbid for this item.

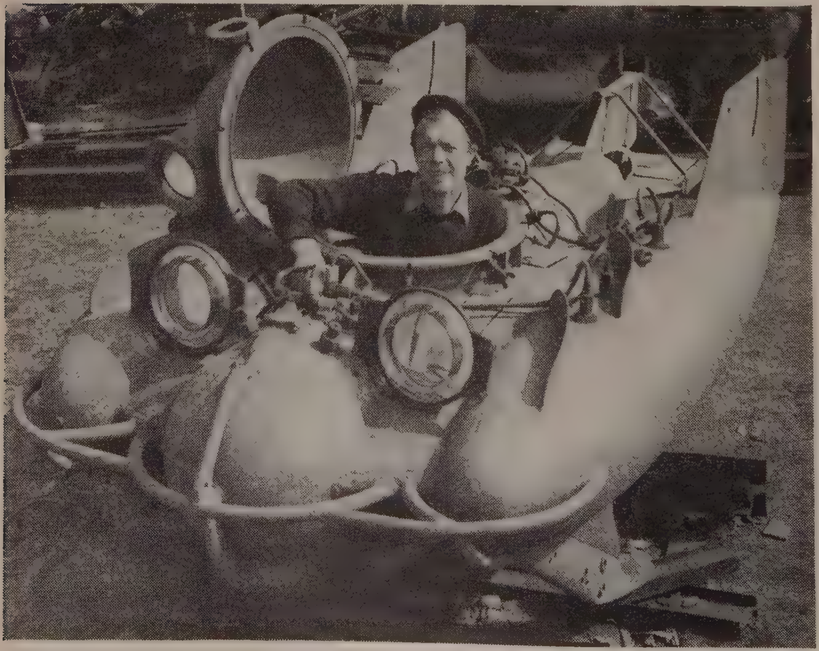
The only reason these mills have received any such railroad scrap in the past year is because the roads are dependent on these mills for hard to get sheet, plates, rails, wheels, etc., and the mills kept them somewhat in line. Recent events suggest that the roads aren't too happy with that earmarking deal and they may sell all their scrap at the highest bids and thereby dare the mills to cut quotas or stop shipment of new product to them.

As far as regular openhearth scrap items are concerned, the mills have done relatively well in building their winter stockpiles. They have clamped down on the quality of dealer scrap. They have insisted on getting good material and they are rejecting cars to back up their claim. Inspection of incoming material is more rigid. They are even breaking the bundles to make sure of the quality. All these practices have not softened the market pricewise, but they have had a stabilizing effect.

Everyone knows good scrap is not plentiful. No one expects such scrap to suddenly become plentiful. Everyone knows that the price of good scrap cannot be lowered as long as conversion-hungry steel consumers continue to comb the country in search of it. This is the main prop under present scrap prices and lower quality grades can't be expected to dip much in price as long as the pressure for steel products remain.

The conversion factor is not nebulous. It is well understood by most buyers and sellers of scrap. It has been a necessary evil. How long it will remain so nobody seems to know. The real unknown factor in the present scrap equation is—foreign scrap. If it gets here, when it gets here, and how much gets here can all affect the market. This scrap is not cheap when all costs are added up. Reliable authorities predict it will certainly help, but they are not deluding themselves that an influx of foreign materials will break the price of the domestic market when all other factors are concerned.

SCRAP USED TO SEARCH FOR SCRAP: *Scrap from a German junkyard in Hamburg was used to build this midget submarine for moving along the ocean bed in search of ship wreckage. The tiny craft which must be towed by a surface vessel can descend over 300 yd and remain under water for 4 hr.*



Buys Stamping Firm

Cleveland

• • • **Variety Machine** & Stamping Co. has been purchased by Wallace F. Ardussi, from Otto Kernspecht, who is retiring. Variety was organized 27 years ago and has facilities for making a large variety of sheet metal dies and stampings up to 54 in. wide and 7/15 in. thick.

Mr. Ardussi was associated with Chrysler Corp. as a research and development engineer for 10 years. He organized and directed the department of research and engineering for Foote Bros. Gear & Machine Co., Chicago, in wartime and was organizer of Foote Bros. Aircraft Devices Div.

aiser's Gamble at Fontana Defies Dire Predictions of Failure

Receding Costs Mark Kaiser As Real Competitor for West Coast Market

By TOM CAMPBELL
News-Markets Editor

v York
• • **Like television** and the
mic bomb Fontana is here to
y. Conceived as a Kaiser gam-
it has defied dire predictions of
demise—predictions which in
ne cases were wishful thinking.

rmed with White House sup-
t and self-induced enthusiasm,
nry Kaiser figured the success
his California steel plant as a
50 chance. That is the rub with
gular" industrialists. What
y consider to be one chance in
undred Mr. Kaiser figures to
a 50-50 roll.

Ienry Kaiser believed that
ner the war would last longer
n most people thought or
e the postwar period would
steel starved. He lost the first
s but hit the bull's eye on the
ond. Because of that his mill
not only stayed in business but
has paid off some of his loan
built up a fancy customer list.

Iis recent $30 a ton increase in
el prices over regular mill
otes in his area was for the pur-
e of paying off his RFC loan.
customers yelled bloody mur-
but they are paying the price.
. Kaiser, unbeknownst to most
siders, had enough potential
iness at the high price to take
e of holes in his order books
case regular customers dropped
. If the present boom for steel
the West Coast lasts for 3
rs and holds up fairly well for
other 2 years Fontana's RFC
es will be greatly reduced.

Vhen and if this happens its
italization will be comparable
other steel plants. If this hap-
s, those who work for, slave for
believe in Mr. Kaiser will have
npletely outwitted and flabber-
ted some of the best steel minds
the country. But if a steel de-
nd depression hits the country
a few years the story may be
r for Mr. Kaiser. Yet even the
C may, like any banker, keep
present management to pro-
its interest.

t is no salve for some steel offi-
ls who thought that by now
ntana would be a thing of the
past that steel business has hung on so long. Five months before the end of the war in Japan steel people almost to a man looked for a big, deep and serious drop in steel output. It did not come. Then they tried guessing 1 year—then 2 years—then 3 years—then gave up. Mr. Kaiser had again won his gamble that the impossible is worth trying for—helped along by one of the best public relation aggregations in the country.

There are today at least two top officials in the steel industry who privately think that Mr. Kaiser may be washed out when cutthroat competition returns to the steel industry. It may be that they are rehashing some of the opinions they had some years ago. Or else maybe they are not getting the latest dope.

One of the toughest bankers in Wall St. believes that Mr. Kaiser and his Fontana steel plant are here to stay. He investigated. What he found out converted him. It could have been a regular Kaiser conversion (when his outfit goes to work on you, you are half licked before they start). But it wasn't. Statistics and study of costs won that banker. So he says.

Mr. Kaiser's men who run the steel plant believe as he does. Not because he has them in the hollow of his hand but because they think they have proved that they can make steel as good as anyone else —at a low out-of-pocket cost.

A top official in the steel industry—who knows his way around —without batting an eye, says (1) Kaiser's steel costs have been going down steadily, (2) the plant is here to stay and (3) it is a formidable competitor on the West Coast. This man is not given to claptrap.

It is said, and some people believe it, that the cost of making pig iron at the Fontana plant is $17 a ton. That is phenomenal considering the obstacles that had

Background

New York

• • • When the warborn Fontana, Calif., steel plant opened for business several years ago there was a great wagging of heads. Would it last? Was it Kaiser's folly? And the taxpayers' loss? Did the flowers around the plants and offices portend a future use for the property? These and many other questions were asked by the old line steelmakers.

But more than questions were the predictions. When the war was over the plant would fold up. Kaiser could not make steel. If he could, his costs would be out of line. Where would he get the customers? Anyway he would be washed out because he did not know anything about steel.

There were few in the East who believed that Fontana was permanent. There are many in top steel circles today who think it is only a matter of time before Mr. Kaiser is washed out of the steel business on the coast. What are the real answers? This story attempts to unfold them for the reader to take his own choice.

to be overcome. The new Kaiser blast furnace to be built will not start with three strikes against it—as the present one did.

A quick glance at Fontana's steel capacity both raw and finished shows that it has expanded from the original setup. Major details follow:

PRESENT FACILITIES

Primary Products	Annual Capacity Net Tons
Coke—90 Koppers-Becker Ovens	355,000
Pig Iron—1200-ton Blast Furnace	438,000
Steel—6 185-ton Openhearth Furnaces	840,000
Finished Products	
Plates—110 in. plate mill, 96 in. max.	350,000
Structurals	100,000
Bars and Small Shapes	100,000
Hot-Rolled Strip and Sheet, 16 in. wide max.	100,000
Cold-Rolled Strip	24,000
Buttweld Pipe—½ in. to 4 in.	100,000

BEING INSTALLED

No. 7 Openhearth Furnace—this will increase ingot capacity to approximately 1 million tons annually.

Yoder Electric Weld Pipe Mill—annual capacity 120,000 tons of pipe in sizes up to 12 in.

Four 4-high stands in hot-strip mill addition, 3/16 in. sheet finishing line, additional slab heating furnace. The installation of these facilities will permit the production of 100,000 tons annually of sheets, 14 gage and heavier, and skelp for the electric weld pipe mill. The combined annual capacity to produce plates, sheets and skelp will be increased to about 720,000 tons.

TO BE INSTALLED

New 1200-ton blast furnace to be started soon—annual capacity 438,000 net tons. When completed total pig iron capacity will be 876,000 net tons.

Fontana steel people are planning heavily on their Eagle Mountain mine to provide the ore requirements for years to come. Kaiser engineers have done well on their coke problem with the quality being somewhat better than a few years ago. When all equipment under installation is completed the Fontana mill will be an important segment of the West Coast steel industry—and a healthy competitor for Eastern interests which may be hunting in that region.

Report Shipments Of Steel to Industry During First Half

New York

• • • **In the first** 6 months of 1948 the oil and gas industry received nearly two-thirds as much steel as in the entire year 1947, according to the American Iron and Steel Institute. Other principal industries also are sharing in the 1948 increase in finished steel shipments, which appear likely to be higher this year than ever before in war or peace.

The oil and gas industry, which is striving to meet an unprecedented postwar demand, received, in the first half of this year for pipelines and other construction and for well drilling, slightly more than 2 million tons of steel, including the amount shipped to warehouses serving the industry. The tonnage was equal to 6.2 pct of total reported steel shipments of 32,256,000. In the full year 1947 the oil and gas industry received slightly more than 3,150,000 tons of steel, equal to 5 pct of total shipments of 63,057,000 tons.

The automotive industry continued to hold first place among industrial consumers of steel. In the first half of this year more than 4,925,000 tons of steel went to the automotive field, excluding tractor firms. That was equal to 15.3 pct of total shipments. The tonnage compares with 9,273,400 tons in the full year 1947, which was 14.7 pct of total shipments in 1947.

The construction industry, including contractors' products and maintenance materials but excluding oil and gas industry construction, received more than 3,700,000 tons of steel in the first half of the current year, equal to 11.5 pct of total shipments. In the entire year 1947 the industry received nearly 7,200,000 tons of steel, 11.4 pct of total shipments.

Rail transportation received 2,535,000 tons in the first half of 1948, equal to 7.9 pct of total shipments. In 1947 the industry was shipped about 4,880,000 tons, equal to 7.7 pct of total shipments.

A pronounced gain was made in shipments to manufacturers of household appliances such as stoves, refrigerators, washing machines and other articles. This classification received more than 973,000 tons of steel in the first half of the present year, equal to 3 pct of total shipments, compared with 1,564,700 tons in the full year 1947, 2.5 pct of all shipments.

Jobbers, dealers and distributors, serving mainly small business, exclusive of oil and gas, shared the increase in the tonnage. They got about 4,850,000 tons or 15.1 pct of all the steel shipped in the first half of 1948, compared with 9,545,600 tons in the full year 1947. The latter figure was also 15.1 pct of total shipments.

A sharp increase was made in shipments to the shipbuilding and marine equipment field, although the tonnage was comparatively small. In 6 months of this year the industry received 269,300 tons, against 377,900 in all of 1947.

Shipments of steel to other industries are included in the following table:

Shipments of Steel to Certain Industries

	Tonnage 6 Months 1948	Per Cent of Total Shipments	Tonnage Full Year 1947	Per Cent of Total Shipments
Containers	2,537,300	7.9	5,076,100	8.0
Mining, Quarrying, Lumbering	158,300	0.5	287,600	0.4
Machinery, Tools and Industrial Equipment, including Tractors	1,487,000	4.6	3,031,700	4.8
Agriculture	746,900	2.3	1,244,500	2.0
Electrical Machinery	793,800	2.5	1,595,500	2.5
Domestic and Commercial Equipment, Other than Appliances, Utensils, Cutlery	874,200	2.7	1,680,200	2.7

-L Will Increase Its Mild Steel Capacity By 300,000 Tons a Year

ttsburgh

• • The three electric furnaces
at Allegheny Ludlum Steel
rp. plans to install in the sec-
d quarter of 1949 will add 300,-
0 tons a year to its carbon steel
got capacity. Cost of the new
cilities, including rental of the
vy Ordnance furnace, soaking
ts and auxiliary equipment, is
timated at $5.5 million. As re-
rted last week (THE IRON AGE,
pt. 30, p. 91), the two new
rnaces will be rated at 70 tons
ch per heat. The navy furnace
ll be rebuilt from a 50 to a 60
n unit.

Swindell-Dressler Corp., Pitts-
rgh, is now building the 70-ton
rnaces and will revamp the
vy unit which it built during
e war. The latter is one of two
nilar furnaces now located near
e Mesta Machine Co. shops at
ys, Pa. They are in a plant
at has since been taken over by
rnegie-Illinois Steel Corp, ex-
pt for the furnaces. It was
iginally intended for gun forg-
g but the furnaces were never
erated. Insufficient power pre-
nts their use at the present lo-
tion.

Cost of the new melting ca-
city which Allegheny Ludlum
s agreed to install and operate
the request of several of its
ge customers is over and above
e company's announced $26 mil-
n dollar plant improvement pro-
am slated for completion in
51. It is hoped to have the three
ctric furnaces in operation dur-
g the second quarter of 1949,
en the company's $3 million
ooming mill is scheduled for
npletion.

Third Quarter Dividend

vannah, Ga.

• • A third quarterly stock divi-
nd has been declared by South-
n States Iron Roofing Co., it was
nounced by Ross G. Allen, sec-
ary and assistant treasurer.

Payable Oct. 1 to stockholders
record on Sept. 15, 1948, the
idend is 31.25¢ per share on
eferred stock and 25¢ per share
common stock.

More than 500 stockholders will
eive the dividend.

Industrial Briefs . . .

• **CONSTRUCTS HOT MILL** — Superior Steel Corp. has announced that it is spending approximately $2 million to build a high-speed hot mill at its Carnegie, Pa., plant. It will roll strip steel up to 18 in. wide. An additional $500,000 was spent in modernizing the firm's cold mills.

• **OPENS WESTERN OFFICE**—U. S. Steel Corp. of Delaware has announced the opening of a San Francisco district office of the Coal Chemical Sales Div. Similar offices were opened recently in Cleveland and Chicago to service consumers of coal chemicals. W. G. Souder will be the western district sales representative with offices in the Russ Bldg.

• **AWARDS CONTRACT** — A contract involving more than $23 million for bombing navigation computers has been awarded to the AC Spark Plug Div. of General Motors Corp. by Procurement Div. officials at Air Material Command Headquarters, Wright-Patterson Air Force Base, Dayton. AC has been authorized to proceed with conversion of the former A. O. Smith landing gear plant in Milwaukee for manufacture of the equipment. The plant is being provided by the WAA.

• **BUILDS HOLLAND PLANT**—The formation of Nederlandsche Kaiser-Frazer Fabrieken, N. V., in Rotterdam, Holland, for the assembly of Kaiser & Frazer automobiles in Europe has been announced recently. The new plant is expected to be completed and in operation by January 1949.

• **MOVES** — The Gray Iron Founders' Society has announced the occupation of its new offices in the National City Bank Bldg. at East Sixth St. and Euclid Ave., Cleveland.

• **NEW DIESEL LINE** — Fairbanks, Morse & Co., Chicago, has announced a new line of diesel electric locomotives in three horsepower ranges—1600, 2000 and 2400. Called the "Consolidation" or "C" line, the new locomotives offer greater flexibility and efficiency in diesel operation.

• **ACQUISITION**—The Carborundum Co., Niagara Falls, has announced acquisition of the Chris-Craft Corp. war plant near Falconer, N. Y. for an unnamed sum to expand its output of refractories. Production is scheduled to start about Jan. 1.

• **BUYS VALVE FIRM**—The Bell Aircraft Corp., Buffalo, has announced the purchase of the W. J. Schoenberger Co. of Cleveland, manufacturer of valves and fittings for gas appliances and air conditioning units. The company will be operated as a subsidiary of Bell Aircraft without change in its official personnel.

• **UNDER NEW MANAGEMENT**—An expansion program at the Harvey Mfg. Co., Inc., Racine, Wis., has been announced by John W. Rourke, president, and Harold R. Mandel, vice-president, who have purchased the firm's interests from C. A. Soelberg and W. S. Mayne. Mr. Rourke is vice-president and sales manager of Havana Metals, Havana, Ill., and Mr. Mandel is president of Maple City Stamping Co., Peoria.

• **CANADIAN OUTLET** — W. A. McLaren Export Corp., Ltd., 615 W. Pender St., Vancouver, B. C., has been appointed sales representative in western Canada by Cleveland Tapping Machine Co., Hartville, Ohio. D. M. Duncan Machinery Co., Ltd., 1922 Wyandotte St., East Windsor, Ontario and 371 Bay St., Toronto, handles sales in the province of Ontario.

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

2300 **Tons**, Sunbury, Pa., addition to steam generating plant for Pennsylvania Power & Light Co., to Bethlehem Steel Co., Bethlehem.
450 **Tons**, Cincinnati, Cincinnati Gas & Electric Co., Dan Zimmerman, Inc., agents, to Bethlehem Steel Co., Bethlehem.
430 **Tons**, Delaware Co., Pa., highway bridges for Pa. Dept. of Highways, through F. A. Canuso, Philadelphia, to American Bridge Co., Pittsburgh.
400 **Tons**, Savannah, Ill., Commonwealth Edison Co. coal handling facilities to Bethlehem Steel Co., Bethlehem.
275 **Tons**, Tonawanda, N. Y., Phillips Sheridan School building, through John W. Cowper Co., general contractor, to R. S. McMannus Steel Construction Co., Buffalo.
190 **Tons**, Crawford, Neb., railroad bridge 42279 for C. B. & Q. to American Bridge Co., Pittsburgh.

• • • **Fabricated steel inquiries** this week included the following:

1400 **Tons**, New York, Brooklyn-Queens express highway.
1300 **Tons**, New York, Secretariat building for the United Nations.
400 **Tons**, Mayview, Pa., food preparation building for Mayview State Hospital, due Oct. 14.
165 **Tons**, Seaside, N. J., bridge from Island Heights to Seaside, N. J., Ole Hansen, Pleasantville, N. Y., low bidder.
100 **Tons**, Wilmington, Del., consolidated quarters apartment building for Veterans Administration, due Nov. 9.
100 **Tons**, Philadelphia, southeast Philadelphia sewage pumping station, Philadelphia Dept. of Public Works, Virginia Engineering Co., Newport News, Va., low bidder.

• • • **Reinforcing bar awards** this week included the following:

800 **Tons**, Chicago, Central Grain Co., loading dock through John S. Metcalf Co. to Inland Steel Co., Chicago.
550 **Tons**, Cook Co., Ill., Northwest intercepting sewer through Paschen Contractors to O. G. Dean Steel Co.
500 **Tons**, Chicago, No. 7 sanitary sewer contract through Paschen Contractors to Ceco Steel Products Corp., Chicago.
370 **Tons**, Madison, Wis., pumping station for the City of Madison, La Crosse Dredging Corp. to Bethlehem Steel Co., Bethlehem, Pa.
325 **Tons**, Ivy Rock, Pa., rolling mill installation for Alan Wood Steel Co., to United Engineers & Constructors, Inc., Philadelphia.
260 **Tons**, Evanston, Ill., Evanston Hospital to R. C. Wieboldt Co.
240 **Tons**, Carbondale, Ill., training school building, State of Illinois, for Southern Illinois Normal through Federal Constructors, Inc., to Laclede Steel Co., St. Louis, Mo.
190 **Tons**, York Co., Pa., first section of Pennsylvania Turnpike extension, to Central Pennsylvania Quarry, Stripping & Construction Co., Hazelton, Pa.
180 **Tons**, Chicago, Southwest sewage treatment plant through Kenny McHugh Contractors to J. T. Ryerson & Son, Inc., Chicago.
125 **Tons**, Delaware Co., Pa., Pa. Dept. of Highways, through F. A. Canuso, Philadelphia, to Bethlehem Steel Co., Bethlehem.
105 **Tons**, San Francisco, paving, water supply, sewerage, etc., at San Francisco Airport, Airport Contract 109, to Judson-Pacific-Murphy Corp., San Francisco.

• • • **Reinforcing bar inquiries** this week included the following:

280 **Tons**, Orange Co., Calif., bridge and approach at Santa Ana River, 4 miles east of Anaheim, Calif. Div. of Highways, Los Angeles, bids to Oct. 21.

• • • **Railroad car awards and inquiries** this week included the following:

The P. R. R. on Sept. 30 opened bids for their 1949 rail requirements of 175,000 net tons. The Frisco Lines have ordered 200 70-ton 52½ ft. gondolas from Pressed Steel Car Co. The American Arabian Oil Co. has ordered from Pressed Steel Car Co. 20 all-steel twin hoppers. The India Supply Mission is inquiring of Baldwin Locomotive for 50 to 100 steam locomotives. The Missouri Pacific has ordered 1000 70-ton gondolas from their own shops in De Soto, Mo.; 500 of these are for the Gulf Coast Line R. R. Div. and 500 for the International Great Northern Div. Delivery of these cars are to be made by Feb. 1949.

Republic's Operation Of CF&I's Buffalo Furnace Terminated

Buffalo

• • • **Termination of** the arrangement under which Republic Steel Corp. operated "Y" blast furnace of Wickwire Spencer Div., Colorado Fuel & Iron Corp., was announced here by CF&I last week.

A. F. Franz, vice-president in charge of operations of Wickwire Spencer Div., said Wickwire Spencer assumed operation of both "X" and "Y" furnaces Oct. 1.

In addition to operating "Y" furnace, Republic has had a blast furnace superintendent at "X" furnace, for which Lake Iron Corp. supplies the raw materials in return for 7000 tons of pig iron per month (THE IRON AGE, Sept. 16 p. 121).

"We are going to try to the best of our ability to take care of some of Republic's customers as well as our own," Mr. Franz said.

"The decision to cancel the working agreement has been a very mutual affair and we have been working it out very satisfactorily to both sides," he declared.

Mr. Franz said the operating agreement was subject to cancellation by either Republic or CF&I on 6 months' notice and that "we have been more or less negotiating with Republic for some time."

He said there had been no change in the operating agreement between CF&I and Lake Iron Corp.

Republic Steel Corp., under its agreement with CF&I, supplied the raw materials for "Y" furnace in return for about half the pig iron output. Mr. Franz said Republic will continue to supply the raw materials for "Y" furnace for the time being.

Forms Operating Company

Hamilton, Ohio

• • • **Formation of the** Hamilton-Thomas Corp., Hamilton, Ohio, to operate Economy Pumps, Inc., Klipfel Mfg. Co., and Liberty Planers, Inc., manufacturing divisions of Hamilton-Thomas, is announced by officers of the newly formed corporation.

Officers of the corporation are Richard Thomas, president; L. G. Thomas, executive vice-president; H. R. Ryan, vice-president; R. H. Thomas, Jr., vice-president; E. T. Drinkuth, secretary; and L. V. Thomas, treasurer.

Economy Pumps, Inc., manufactures centrifugal, axial flow and mixed flow type pumps in a wide range of sizes up to 150,000 gal per min. Liberty Planers, Inc., is widely known for machine tools, double housing, openside, frog and switch and die block planers. Klipfel Mfg. Co. has produced automatic regulating valves, pressure reducing valves, float and lever valves, thermostat valves, back pressure and relief valves and pump governors.

Creation of the Hamilton-Thomas Corp. as the operating organization is part of a widespread expansion program in the manufacture and distribution of products of each division.

Buys Electro Alloy Plant

Wenatchee, Wash.

• • • **The Keokuk** Electro-Metals Co. of Keokuk, Iowa, has purchased the war constructed electro alloy plant at Rock Island on the Columbia River and announces intention to begin operation immediately.

During the war this plant was operated for the government by the Electro Metallurgical Corp. in producing ferro-silicon. The site includes 39 acres and the plant contains three electric furnaces with storage, reduction, conveying and sundry equipment.

It is announced that iron ore from northeast Washington will supply the new operators.

Concepts Of Industrial Mobilization Planning Being Broadened

Voluntary Allocation Program Seen Eventually Including Strategic Stockpiling

◦ ◦ ◦

By KARL RANNELLS
Washington Bureau

◦ ◦ ◦

Washington

• • • **Industrial mobilization** planning has come to life.

Buying of critical materials for the nation's stockpile, blocked for nearly 3 years by high prices and governmental indecision, is finally getting under way on a large scale.

One of the newer developments is the definite probability that the voluntary allocation program will be extended to include industrial set-asides for the stockpile. Another major development is the completion by the chiefs of staff, of a top-secret summary of M-Day industrial requirements.

This summary has been turned over to the Munitions Board. In cooperation with the National Security Resources Board, the former will round out an up-to-date, effective plan for enabling the nation to obtain peak emergency production at the fastest possible clip.

Spadework has been completed in this direction. Special purpose war plants have been retained in standby condition; others have been disposed of subject to government recapture.

Nearly half of the total 182,000 wartime machine tools tagged as set-asides for emergency use have been cataloged and stored. Phantom machine tool orders have been set up as dry-runs as a future guide for the industry. (THE IRON AGE, Sept. 30, p. 76).

The board has substantially completed the assignment of procurement authority in the armed forces under a new unified method by which one service buys the other two. About 75 pct of all military purchasing is now made in this manner.

In addition, the board is well along with its survey of manufacturing plants by which it expects to settle in its own mind the potential war productive capacity, where it is located, and how quickly conversion could be carried out.

So far, about 12,000 plants have been designated for specific types of emergency production. These have been allocated to the military procurement service which would do the buying during wartime. It is expected that at least 25,000 plants will be lined up in this manner.

Biggest headache for the board has been the stockpiling program. Public Law 520, 79th Congress, authorized and directed the board to buy and store—over a 5 year period—$3.2 billion ($3.4 billion at current prices) worth of industrial materials which, for the most part, must be obtained from foreign sources.

Hedged in by restrictions, domestic shortages, and small appropriations, progress has been slow. With 2 years gone, around $2.4 billion worth remains to be purchased. Purchases and commitments to date total roughly about $800 million; even these are spotty as to type of materials with stocks of some of the most critical items very short.

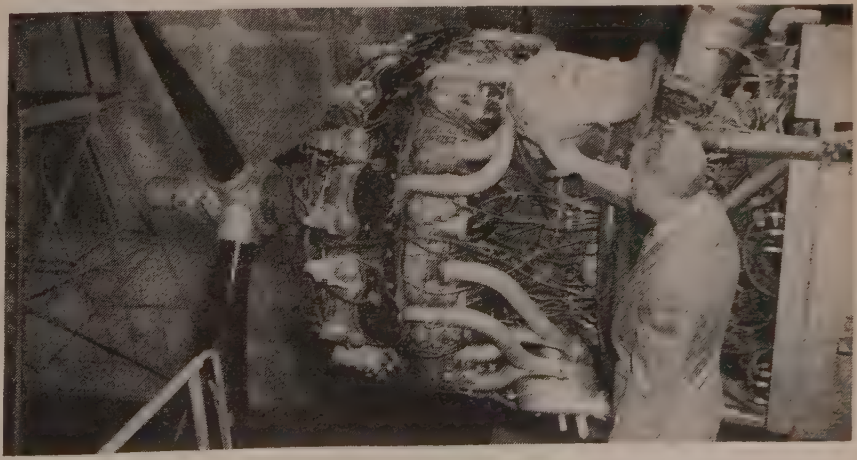
Deplorable condition of the stockpile, as revealed at closed hearings last spring, rocked Congress back on its heels. Not only had it been somewhat remiss in the matter of adequate appropriations but the board apparently had been more than literal in interpreting the law—as evidenced by its reluctance to buy at high prices or to bid against industry in a period of domestic shortages.

During the first fiscal year, only about $9 million was actually expended out of an appropriation of $100 million but commitments were made to the extent of another $81 million worth. For the second year, Congress appropriated another $100 million; the board spent $78 million and contracted for an additional $229 million worth.

Once aroused to the situation, Congress swung to the extreme. Some members strongly urged imposition of mandatory controls on items in shortest supply with substantial percentages ordered to the stockpile. This was just as strongly opposed by the board.

In the end, appropriations were stepped up without specific directions as to how the more critical items were to be obtained. Appropriations for 1949 provided $300 in new money (plus $113 million left over from 1948); in addition, the board was authorized to contract for an additional $300

RECUPERATOR: *The new turbo-cyclone 18-compound jet engine made by the Wright Aeronautical Corp. utilizes exhaust gases through the "compounding" principle to increase by 20 pct the range of U. S. military and commercial aircraft, according to company officials. It is being put into production for the U. S. Navy as a part of a $32 million contract.*



million worth—which Congress promised to pay off.

In the meantime, the White House—which had hitherto failed to raise its voice concerning the lagging appropriations and expenditures—dealt itself into the game. It quietly dispatched a communication to the Commerce Dept., then getting under way with the voluntary allocations program. The Executive Mansion recommended that the Office of Industry Cooperation try to work out a plan, acceptable to industry, by which certain amounts of the more critical of the 67 Class A items would be set aside by industry for the stockpile. (THE IRON AGE, July 1, p. 71.)

Experimental steps in this direction will be taken this month. Commerce Secretary Sawyer has asked producers of copper, lead and bismuth, and zinc and cadmium, to meet jointly with OIC and the Munitions Board in Washington to discuss the matter.

Dates of these meetings have been set as follows: Copper, Oct. 12; lead and bismuth, Oct. 19; and, zinc and cadmium, Oct. 20. If successful in working out such a program for these metals, other meetings for more items will be scheduled.

In the meantime, the National Assn. of Manufacturers has inconspicuously entered the picture. Seriously disturbed, not only at continuing shortages but the lagging stockpiling program, it has embarked upon what might be termed an "educational" program.

It will endeavor to emphasize to industry the whys and wherefores of the need for such cooperation. It aims at obtaining 100 pct support. A series of conferences for the various industries will be held. The first, with the asbestos industry, was held on Sept. 29 in New York.

Likewise, the NSRB has set up a task group for the purpose of developing control methods in event of an emergency. This group is composed of members of the Munitions Board, the NSRB, Atomic Energy Commission, and the Depts. of Agriculture, Commerce, Labor and Interior. The Budget Bureau and Maritime Commission may also be represented.

With the wheels so greased, officials are looking for the stockpiling program to go into high gear. For obvious reasons, the board refrains from stating either the anticipated rate of acquisition or the overall amounts needed.

It is likely, however, that between now and next July the board will endeavor to buy or contract for at least 90,000 tons of copper, 48,000 tons of lead, a similar tonnage of zinc, 13,500 tons of tin, 450 tons of cadmium, 150 tons of bismuth, and around a million tons of manganese.

This estimate is based on assumption that quarterly purchasing for the remainder of the fiscal year will remain relatively stable; it is approximately three times the purchasing program which has been announced for the fourth quarter 1948.

Coming Events

Oct. 5-9 **Concrete Reinforcing Steel Institute,** semiannual meeting, Asheville, N. C.
Oct. 6-9 **Society of Automotive Engineers,** national aeronautic meeting, Los Angeles.
Oct. 11-13 **National Lubricating Grease Institute,** annual convention, Chicago.
Oct. 11-13 **American Society Tool Engineers,** semiannual meeting, Los Angeles.
Oct. 13-15 **Porcelain Enamel Institute,** annual forum, Urbana, Ill.
Oct. 14-15 **Gray Iron Founders' Society,** annual meeting, Atlantic City,
Oct. 18-20 **National Metal Trades Assn.,** annual convention, New York.
Oct. 18-22 **National Safety Congress and Exposition,** Chicago.
Oct. 22-25 **Metal Treating Institute,** annual meeting, Philadelphia.
Oct. 23-29 **American Society for Metals,** annual convention, Philadelphia.
Oct. 24-29 **American Welding Society,** annual meeting, Philadelphia.
Oct. 25-27 **American Institute of Mining and Metallurgical Engineers, Metals Div.,** fall meeting, Philadelphia.
Oct. 25-27 **American Gear Manufacturers Assn.,** fall meeting, Chicago.
Oct. 25-29 **National Metal Exposition,** Philadelphia.
Oct. 27-28 **Society for Nondestructive Testing,** annual convention, Philadelphia.
Nov. 4-6 **National Electronics Conference,** Chicago.
Nov. 14-17 **National Tool & Die Manufacturers Assn.,** annual meeting, Milwaukee.

Some dependence is placed on the ECA to boost stockpile acquisition; in some fields, however, such as copper, lead and zinc, the world situation is equally as tight.

The fight to obtain passage of the Russell Bill was carried up to the final day's session but was lost in the shuffle of adjournment. It will be revived when the new Congress convenes.

U. S. and Britain Agree On Uniform Price For German Rubble Scrap

Washington

• • • **Export of German** rubble scrap to the United States was a step closer to reality this week, following agreement by the U. S. and the United Kingdom to abide by a uniform price.

The text of the agreement signed by the two nations does not state any given price. This is a matter to be determined by the military governors of the U.S. and the U.K.

Principal effect of the new agreement is to lift the embargo on scrap exports ordered weeks ago by General Clay. Until the embargo was applied, British representatives consistently outbid U.S. representatives.

The new agreement provides for the immediate allocation from the bizonal area of 500,000 tons of scrap each to the U.S. and to the U.K., and 225,000 tons for distribution to other countries at a uniform price. The State Dept. expects the total quantity to be shipped in the next year to be about 2 million tons or more.

Representative W. Kingsland Macy, R., N. Y., principal Capitol Hill advocate of German scrap imports, said he would watch subsequent developments "very carefully to see that this scrap is brought to this country as rapidly as possible."

"We're watching very closely the developments on setting up an American scrap-purchasing corporation in Germany. If necessary, we'll hold a congressional hearing to iron out any difficulties. Now that we've got this badly-needed scrap, our subcommittee will keep an eye on it to see that it moves rapidly and advantageously."

Weekly Gallup Polls . . .

Eleven States Covered Show Dewey Holding Advantage

Princeton, N. J.

• • • **Poll reports completed for** three new states show President Truman ahead in one and Governor Thomas E. Dewey leading in the other two. The Truman state is Minnesota, which went Democratic in the last four presidential elections. It now gives the Truman ticket a lead of 5 percentage points over the Dewey ticket, according to George Gallup, director, American Institute of Public Opinion.

The other two states are Massachusetts and Indiana, where Governor Dewey's lead is substantial. The figures are:

MINNESOTA

(11 electoral votes)

	Pct
Truman	47
Dewey	42
Wallace	4
Undecided	7

MASSACHUSETTS

(16 electoral votes)

	Pct
Dewey	49
Truman	42
Wallace	3
Undecided	6

INDIANA

(13 electoral votes)

	Pct
Dewey	49
Truman	40
Wallace	3
Undecided	8

Although the remaining weeks f campaigning may change the ituation in Minnesota, the curent poll findings there are imortant for two reasons. First, hey indicate that Mr. Truman's opularity in middle western farm tates may be on the increase and, econd, the strength of the Demoratic presidential ticket in Minesota may have an important earing on the Senate race in which Senator Joseph H. Ball, he incumbent Republican, is unning for re-election against Hubert Humphrey, the mayor of Minneapolis.

The report brings to 11 the number of states covered by the institute in its series on political sentiment in the individual states.

The figures for the eleven states reported so far are given below:

	Dewey Pct	Truman Pct	Wall. Pct	Undec. Pct
N. Y.	42	32	14	12
Pa.	53	37	3	7
N. J.	50	38	3	9
Mass.	49	42	3	6
Ohio	50	38	3	9
Ind.	49	40	3	8
Wis.	51	38	3	8
Minn.	42	47	4	7
Mo.	36	53	—	11
Calif.	46	41	5	8

•

• • • **While Gov. Thomas E. Dewey,** the Republican candidate, still holds a substantial lead in popularity, Mr. Truman has gained in recent weeks. The poll, completed just before he started on his western campaign swing, shows the following trend:

"If the presidential election were being held TODAY how would you vote—for Truman, Dewey, Wallace or some other candidate?"

The vote:

	June Pct	Aug. Pct	Today Pct
Dewey	49	48	46½
Truman	38	37	39
Wallace	6	4	3½
Thurmond	—	2	2
Others	*	*	*
No opinion	7	9	9

* Less than 1 pct.

Norman Thomas, Socialist Party candidate, runs ahead of the other minor party candidates, although all minor parties combined poll a total of less than one pct. Minor parties with candidates entered include the Socialist Workers Party, the Socialist Labor Party, the Prohibition Party, the Greenback Party, the Vegetarian Party and several others.

The percentage that President Truman polls in the November election will depend to a considerable extent on how successful the Democrats are in arousing interest in the election and stimulating a big turnout.

Poll Indicates Democrats' Apathetic Attitude Toward Candidate Harmful to Cause

° ° °

If voter apathy continues and turnout falls considerably under the 58,000,000 votes, which would be a normal turnout for 1948, that would be a factor unfavorable to Mr. Truman and favorable to Governor Dewey.

One of the best indices of probable turnout in November is voter registration in New York City. The percentage increase in the total number of registrations, as compared to 1944, will give a fairly reliable indication of how much the national turnout will increase in November as compared to 1944 when 47,974,868 votes were cast. Generally speaking, a small turnout hurts the Democrats because the stay-at-homes are predominately Democratic in sentiment; or to put it another way, there is usually more voter apathy among Democratic ranks than among Republican ranks.

The importance to the Democrats of getting out a big vote is shown in a special analysis in this poll based on the question, "How certain are you that you will vote,"

This shows that people who are not certain that they will vote or who don't plan to vote at all tend to favor Mr. Truman more than Gov. Dewey. In short, if the Democrats could overcome apathy and stay-at-home-ism, their candidate would poll a higher percentage on election day.

"How certain are you that you will vote in the election?"

	Absolutely Certain Pct	Uncertain Pct	Don't plan to vote Pct
Favor Dewey	52	41	27
Favor Truman	37	46	37
Favor Wallace	4	2	5
Favor Thurmond	2	2	1
No choice at present	5	9	30

Four Bids Received For Government Openhearths

Chicago

• • • **WAA has received four bids** to lease the open hearth section of a government owned steel foundry in East Chicago, Ind., all of which proposed payment on a production basis with minimum monthly or yearly rental guarantees.

Rotary Electric Steel Co., Detroit, estimates a production of 15,000 tons a month of rimmed steel ingots there for sale to the automotive industry. The company, seeking a 5-year lease, offered to pay $3.15 per gross ton a month for the first 12,000 tons produced and $3.50 per ton on all production in excess of 12,000 tons, with a minimum guaranteed monthly rental of $37,800.

The Glazer Steel Corp., Knoxville, Tenn., estimated steel ingot production of 180,000 tons a year, and offered to lease the facility for 5 years at $2.88 per gross ton produced, or a guaranteed minimum annual rental of $180,000. The Glazer bid stated that the company would produce steel ingots to be used for making pipe to convey natural gas to many large industries, including the Atomic Energy project at Oak Ridge, Tenn.

Pittsburgh Mills Steel Co., Inc., New York, seeking to lease the facility for 2 years, estimated a production of 60,000 gross tons of steel ingots a year. Payment would be on terms of $5 per gross ton for the first 10,000 tons produced, with a $50,000 annual minimum rental guarantee. An additional $2.65 would be paid for each gross ton to be produced, subject to direct maintenance and repair charges.

Portsmouth Steel Corp., Portsmouth, Ohio, offered to lease the facility for 3 years with rental set at $3 per net ton of steel ingots produced, or a minimum guaranteed annual rental of $324,000.

The property is a portion of the steel foundry operated during the war by American Steel Foundries for the production of cast armor and steel castings. The openhearth section includes a production area of approximately 267,000 sq ft, six openhearth furnaces, and other machinery and equipment. Final decision on the bids will be made by the WAA general board in Washington.

Signode Buys in Weirton

Weirton, W. Va.

• • • Another steel user will build near a steel mill. Signode Steel Strapping Co., of Chicago, plans to erect a 12,000 sq ft building on an 8-acre tract here. The land, bought from Weirton Steel Co., is part of Weirton's 500-acre industrial development site.

Weirton is not Signode's only steel supplier. A prominent reason for selecting the new location is believed to be proximity to steel producers, who buy 25 pct of Signode's strapping. The move is not an outcome of the change to F.O.B. mill steel selling. It was planned before that change came. Signode has three plants in Illinois and one in Baltimore.

50 YEARS AGO

THE IRON AGE, *October 5, 1898*

• "Iron and steel consumers in some quarters are deferring the purchase of needed material in the hope that later in the year prices will recede. So thoroughly have consumers been educated to the prevalence of extremely low prices that they cannot bring themselves to believe that even a possibility exists of the establishment of a higher level of values. Those who are looking for a decline to the old rates may find they are hugging a delusion."

• **"England watches jealously the advance of Germany as an industrial power, reaching for a wider trade; the Germans are concerned about the development of manufacturing in Russia, and so on. Especially is each on the lookout for indications of the plans of others in Asia and Africa, not because of the square miles involved but because of important trade advantages gained."**

• "The John A. Roebling's Sons Co. are now manufacturing rubber insulated wires at their new factory recently completed in Trenton, N. J. The very best and latest machinery has been installed for preparing the rubber for insulating all sizes and kinds of electrical conductors from light wires to heavy cable."

• **"At the Stockholm meeting of the Iron & Steel Institute, C. P. Sandberg, the well-known European authority on steel rails, presented a paper entitled 'Danger of Using Too Hard Steel Rails.' He argued against the growing U. S. practice of calling for rails of 0.5 carbon and upward. Robert W. Hunt then summarized American experiences in an admirable manner."**

• "Westinghouse Electric & Mfg. Co. of Pittsburgh have just finished complete electrical equipment for a transcontinental train of the Canadian Pacific R.R. which will make it the first train in the world to be lighted from power generated by the train itself."

Scrap Officers Elected

Buffalo

• • • **Herman Schwartz** of Rochester was elected president of the Western New York Chapter of the Institute of Scrap Iron & Steel at the annual meeting. Leo Fagin of Buffalo was reelected secretary and treasurer and T. G. Hanlon of Buffalo was chosen vice-president.

Surveys New Plant Site

Vancouver, B. C.

• • • **The Aluminum Co.** of Canada is surveying power sites for a proposed $300 million plant and townsite. The survey is being made by International Engineering Co. of San Francisco and contemplates a townsite for 50,000 people.

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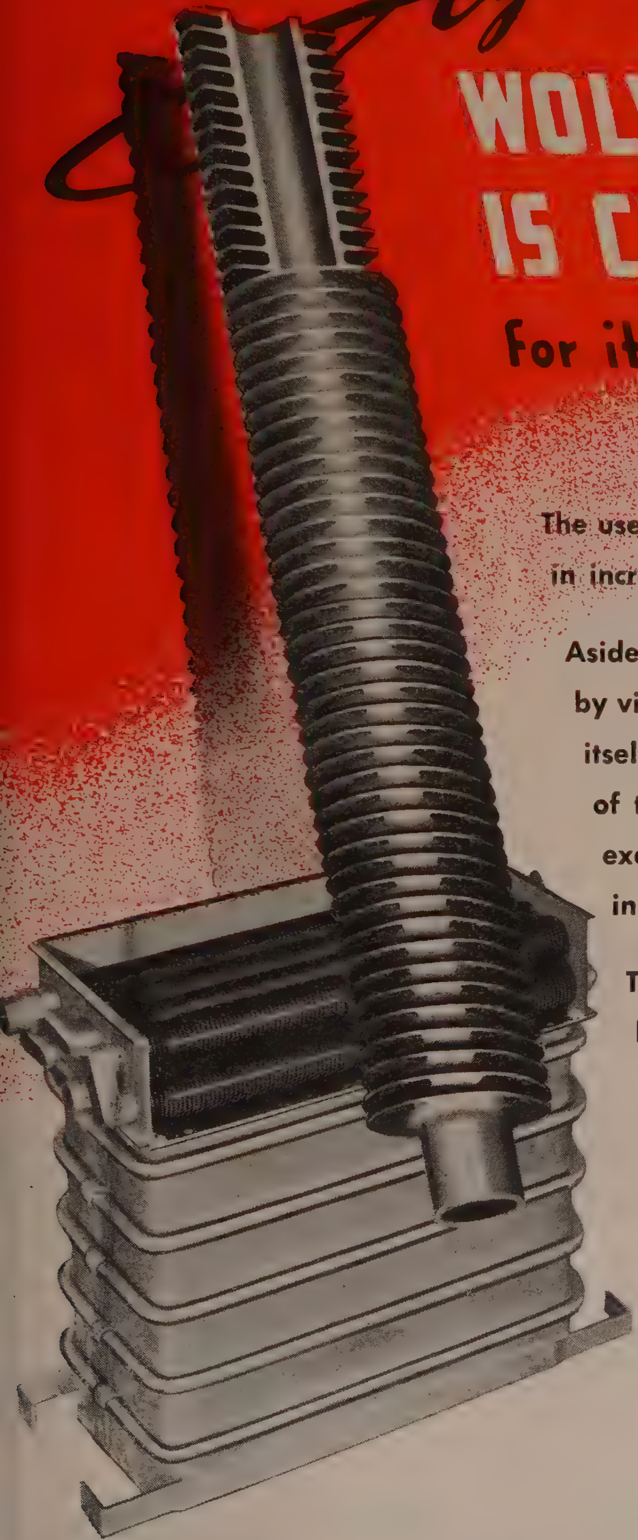

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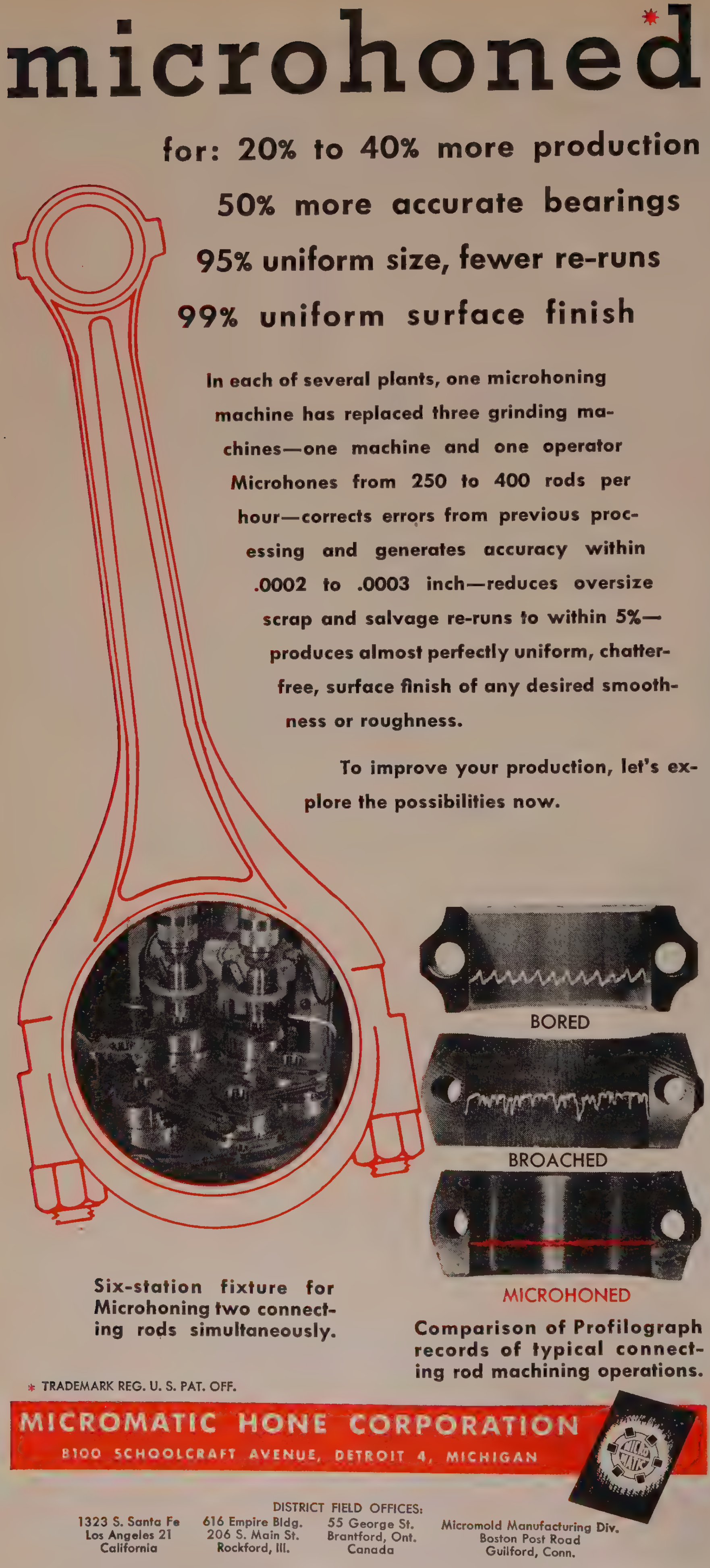

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Raw Materials Cited As Limiting Factors On Britain's Output

London

• • • **Britain's** Trade Union Congress recently overwhelmingly rejected a resolution calling for the immediate nationalization of the iron and steel industry by "emergency measures" and instead reaffirmed its support of the Labor Government.

The resolution, moved by the foundry workers and seconded by the powerful Amalgamated Engineering Union, welcomed the assurance that steel would be nationalized during the life of this Parliament, but added that "in view of the extreme gravity of the supply position and the urgency of an expanding iron and steel production, Congress is of the opinion that the Labor Government should take immediate emergency measures to nationalize the steel industry as a necessary prerequisite to the rapid reorganization and expansion of steel production."

Two representatives of the steel workers—Mr. Lincoln Evans, secretary of the Iron and Steel Trades Confederation, and Mr. A. Calligan, a blast furnaceman—opposed the resolution. Both are members of the Iron and Steel Control Board, and neither showed much enthusiasm even for the principle of steel nationalization. On the contrary, by implication, they appeared to doubt the wisdom of disturbing the industry.

Mr. Evans told Congress that the problem of increasing output was not one of plant and capacity, but of raw material. It was very doubtful, he said, if there would be sufficient raw material to reach an output of 15 million tons in 1949. Mr. Evans said that the movers of the resolution had spoken as if immediate nationalization was going to mean increased production.

They seemed to forget the existence of the Iron and Steel Board. In 2 years plans to the extent of £170 million had been approved and were in the process of being built. If there was some delay this was due not to lack of drive on the part of the Board but to the dearth of equipment. Some schemes had been falling behind because there

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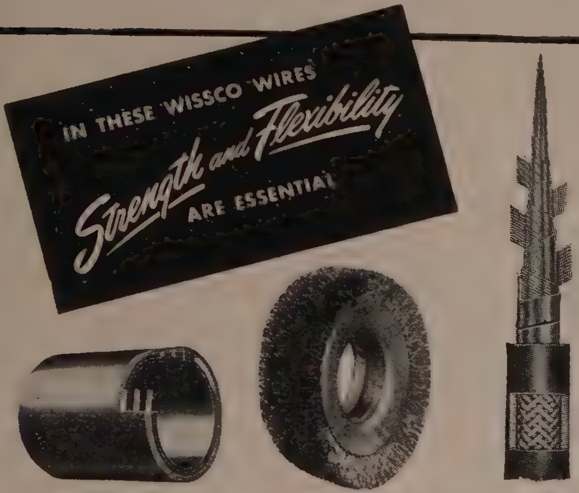
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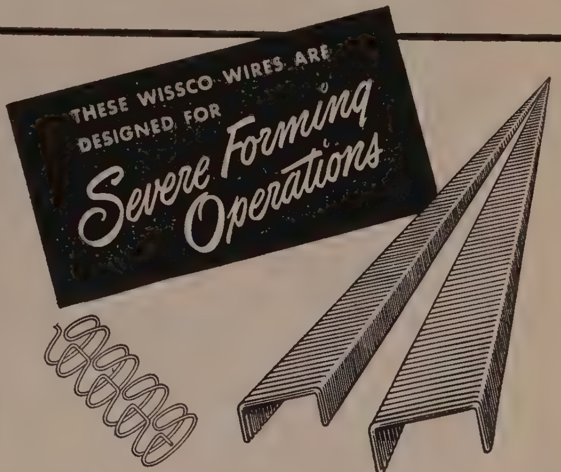
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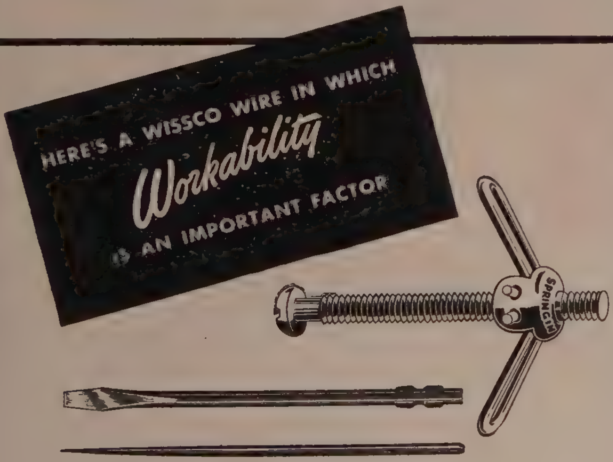
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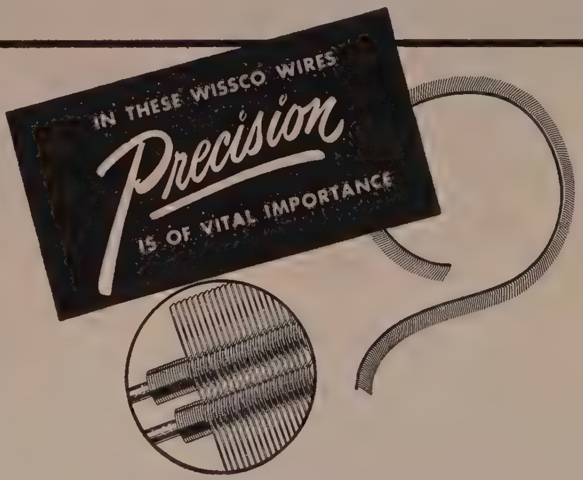
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were no electric motors to enable the job to proceed. This was a matter for the engineering trade, not the steel industry.

It would be impossible, said Mr. Evans, to increase steel capacity to 18 million tons, probably until the 1950's. If that capacity existed now, he asked what about the extra coal, ore and scrap required? The cold fact was that it was very doubtful if there would be sufficient raw material to reach an output of 15 million tons in 1949.

They could build until they were sick, but unless there were sufficient raw materials they were simply misleading the public. His Confederation (the Steelworkers' trade union) had been accused by the movers of the resolution of "condoning monopoly practices."

This came ill from people working a five-day week, while steel workers were doing a continuous week, said Mr. Evans. As a result, the steel workers had increased output this year by three-quarters of a million tons. To have achieved this result otherwise than by longer hours would have called for additional capacity involving an expenditure of £30 million.

Bureau of Mines Reports Cover Chinese Bauxite

Washington

• • • Bauxite deposits discovered recently in the province of Fukien on the southeast coast of China offer the most favorable domestic source of raw materials to establish an alumina industry in that country, according to a survey of the light-metals industries in China, the Bureau of Mines has announced. Issued as Special Supplement No. 23, Mineral Trade Notes, the survey was based on reports compiled by Richard E. Kleinhans, senior economic analyst at the American Consulate, Shanghai, China.

Included in the Bureau report are descriptions of light-metals plants and facilities in China along with a list of Japanese fabricating plants for light metals, copper, and copper alloys.

A free copy of Special Supplement No. 23, Mineral Trade Notes, titled, "The Light-Metals Industries in China," may be obtained from the Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pa.

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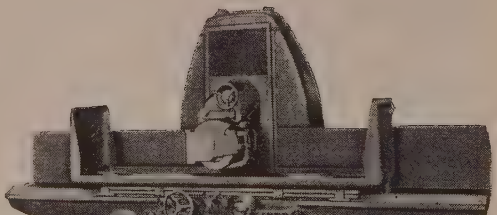

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British Steel Prices Have Increased Less Than Other Products

London

• • • **Iron and steelworkers' wages** have gone up 107 pct compared with prewar. Raw materials cost 80 pct more. Yet steel price increases have been confined to 69 pct above 1938. This success, which means a notable gain to the national economy, is the subject of a special review by the British Iron and Steel Federation. It results from a gain of no less than 30 pct above prewar in output per man-year in steel melting and rolling.

Improved productivity has made possible a substantial rise in weekly earnings without a corresponding advance in steel prices. In other words, the benefit has been shared by workers in the industry and consumers of its products.

"The figure for output per worker reached 128 pct of 1938 in the second quarter of 1948," says the Federation. "Some reduction must be expected in the third quarter, due to the effect of holidays on output, so that too much weight should not be given to the high figure for the second quarter."

Output per man-year in steel melting and rolling, with 1938 as 100, and output given as net value at constant prices, is shown below:

	Operatives*	All workers
1938	100	100
1945	110	106
1946	118	114
1947	119	114
1948—1st quarter	131	126
1948—2nd quarter	134	128

* "Operatives" excludes administrative, technical and clerical grades.

As was to be expected, the index of volume of production shows a considerably greater increase in total output since 1938 than is shown by the crude output of ingots and castings only.

Indices of Steel Production
1938 = 100

	Tonnage of ingots and castings produced	Volume of output in steel melting, rolling, etc.
1938	100	100
1945	114	126
1946	122	133
1947	120	138
1948—1st quarter	144*	157*
1948—2nd quarter	147*	161*

Annual rate*

This result is of interest, as it has been suggested in some quarters that the high figures of ingot production reached this year in some way overstate the real increase in output—possibly through the industry concentrating on the more easily produced classes of steel.

"Quite the reverse has, in fact, occurred," says the Federation. "It is the types of steel product in which high workmanship is required which have, on the whole, increased most, as well as the lighter and smaller sizes, where more processing is needed than on the heavier products."

Many factors have contributed to the considerable expansion in steel output. The continuous working week has been an important influence, aided by the first benefits of the industry's big development plan. New melting furnaces which have come into operation have materially improved the pig-iron supply. Conversion of some furnaces to oil burning has reduced the melting time, although these furnaces are proving expensive to run as compared with their coal counterparts. Generally, plant throughout the country is gaining in efficiency as deferred wartime maintenance is carried out, and a continued growth in output is confidently looked for as the development plan is gradually implemented.

Declares Dividend

Cleveland

• • • **Directors of** Arthur G. McKee & Co. declared a dividend of $1 per share on the Class B stock, Sept. 8, payable Oct. 1 to stock of record Sept. 20. With this payment, dividends total $2.75 to date in 1948. Previous dividend payments this year were made in the amounts of 50¢ each on Jan. 2 and Apr. 1 and of 75¢ July 1. Next meeting of the directors for consideration of dividend payments will be held early in December.

The McKee Co. reported that it will complete several petroleum refining installations and blast furnaces this year, and that substantial progress on other large domestic and foreign projects is being made.

Although the volume of new contract work to date in 1948 is not as large as the record volume taken during the corresponding period in 1947, inquiries on hand and negotiations in process are promising for additional new contract work in large volume.

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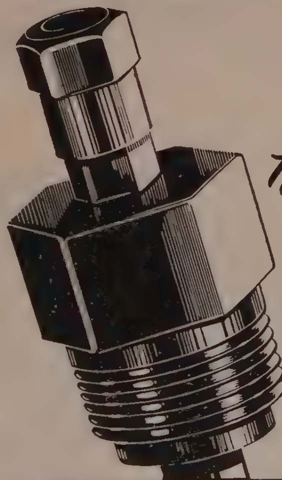

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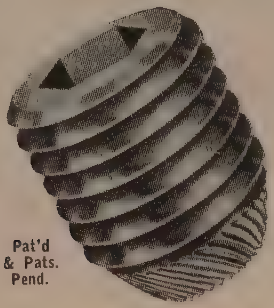

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3 Million Workers Are Covered by Insurance Through Bargaining

Washington

• • • **At least 3 million** workers were covered by some type of health, welfare or retirement benefit plan under collective-bargaining agreements by mid-1948, according to a recent survey conducted by the Bureau of Labor Statistics, Dept. of Labor.

About 45 pct of the 3 million workers are covered by plans which provide health and welfare benefits, except retirement. Such plans include one or more of the following benefits: Sickness or accident, hospitalization, surgical, maternity, medical care (services or cash), accidental death or dismemberment, welfare assistance, life insurance, and death. About 44 pct of the workers are covered by pensions in addition to one or more health and welfare benefits. About 11 pct are covered solely by retirement or pension provisions.

Nearly 100 of the 200 national and international unions surveyed were found to have plans, either on a local union or national union basis. These 100 unions have an estimated 12 million members.

Among industries in which large numbers of workers are covered by some type of employee benefits, clothing and textiles combined account for at least 875,000 and coal mining for upwards of 450,000. Over 150,000 bus and street and electric railway workers are similarly covered; in steel more than 300 collectively-bargained contracts contain health, welfare, or insurance clauses covering approximately 138,000 workers.

The present trend in collectively-bargained plans, according to the data compiled by the bureau, is toward complete financing by the employer, or toward lowering the employee's share of the cost in a contributory plan.

The report also traces the growth and development of employee-benefit plans and summarizes postwar developments in this field. Reference is made to the regulation of health and welfare funds by the Labor Management Relations Act and to recent decisions of the National Labor Relations Board on the employer's obligation to bargain collectively on employee-benefit plans.

Freight Car Output Reached a New High

Washington

• • • **Domestic freight** car production during August reached a new high of 10,394 under the voluntary agreements program, the Office of Industry Cooperation and the Office of Defense Transportation have announced.

June freight car production totalled 10,387, and July 8,809, for an average monthly output during the period June through August of 9,863 cars, or 137 cars short of the 10,000 car-per-month goal of the government-sponsored program.

The decrease in July car production was due principally to the inability of some steel producers to meet previous commitments because of loss of steel production resulting from work stoppages in the coal mines earlier in the year, the government agencies said. Some car builders also were short of items necessary to make up "car sets," which are the components such as wheels, brakes, frames and other parts necessary to construct a complete car.

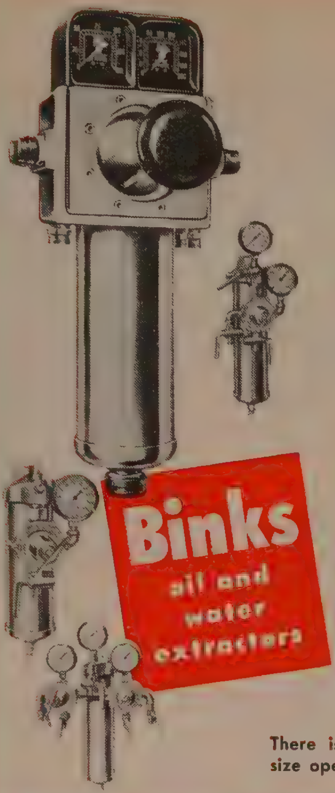
Month by month domestic freight car production from August 1947 through August 1948 follows: August 1947, 6,021; September 1947, 7,745; October 1947, 8,364; November 1947, 8,938; December 1947, 9,823; January 1948, 8,949; February 1948, 8,463; March 1948, 9,302; April 1948, 9,052; May 1948, 9,192; June 1948, 10,387; July 1948, 8,809; and August 1948, 10,394.

Gives Talk on Corrosion

New York

• • • **F. L. LaQue** recently presented a general discussion on corrosion with particular reference in the handling of brines and certain specific problems encountered in the production and refining of petroleum before a meeting of the Carlsbad, New Mexico, chapter of the American Institute of Mining and Metallurgical Engineers.

Mr. LaQue, who is a well known authority in the field of corrosion and also president of the National Assn. of Corrosion Engineers, is in charge of the corrosion engineering section of the International Nickel Co.'s research and development division in New York.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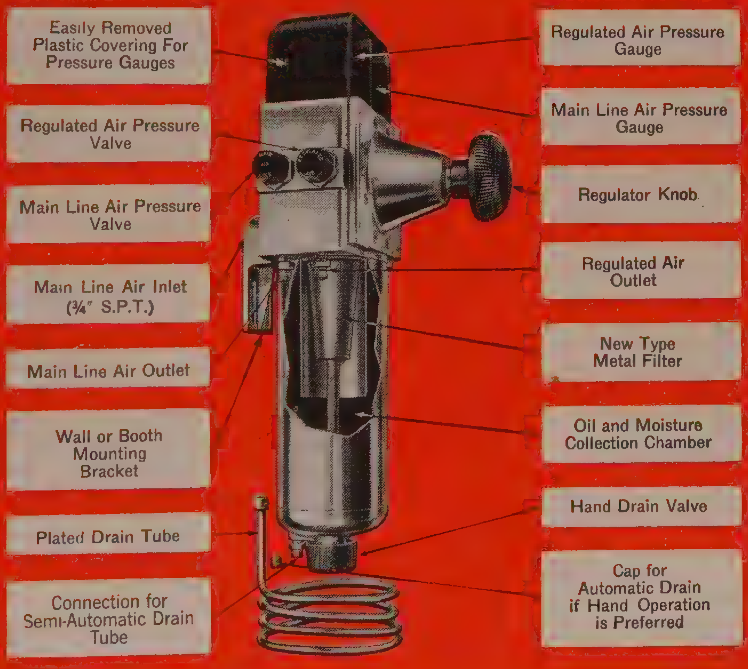
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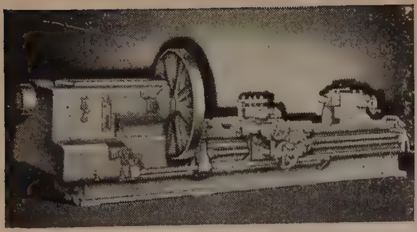


SLIDING BED GAP LATHES HAVE ENCLOSED QUICK CHANGE BOX AND HARDENED STEEL BED WAYS

Two heavy duty sliding bed gap lathes recently redesigned by The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio, are built with a totally enclosed, automatically lubricated quick change box, and hardened and ground steel bed ways front and rear.

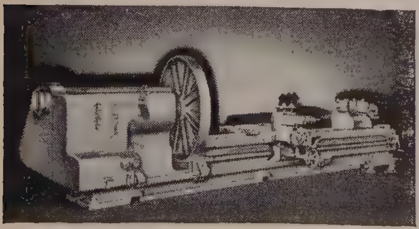
These improvements have been standard for some time on many LeBlond heavy duty engine and tool room lathes, and have been added to the 25″/50″ (above) and 32″/60″ (below) sliding bed gap lathes which are now said to be the most advanced of their type.

The new enclosed quick change box on both models offers two optional ranges of 48 feeds and threads. The entire mechanism is sealed in an oil-tight casting and is lubricated automatically, requiring no operator attention. It has steel gears throughout, and sliding gears are mounted on splined shafts.

The hardened ways test at 64 Rockwell C, retain lubricant and thereby reduce friction and wear, and are replaceable in the event of accidental damage. The front way is fitted to conform to the LeBlond compensating vee-way principle.

The LeBlond sliding bed gap lathe line includes a smaller model—16″/38″—which will in the future be equipped with hardened ways.

For additional information on the LeBlond sliding bed gap lathes, write today for your copy of SBG-101. Address The R. K. LeBlond Machine Tool Co., Cincinnati 8, O.



(Advertisement)

Exports Continue To Drop, Setting New Low

Washington

• • • The volume of iron and steel exports continued to drop in July, according to the Commerce Dept. The agency set the month's export tonnage at 320,190 net tons—another new low for the year.

Total exports of iron and steel for the first 7 months of 1948 thus reached 2,777,598 net tons at the end of July.

Net tonnages of iron and steel commodities exported during July are: Ingots, blooms, billets, slabs, sheet bars, 18,090; wire rods, 2603; skelp, 2020.

Iron bars, 138; concrete reinforcement bars, 13,498; steel bars, coldfinished, 3484; other steel bars (excluding alloy), 17,607; alloy steel bars, 2134; welding rods, electric, 1187.

Boiler plate, 1201; other plates, not fab, 26,736; plates, fab, punched or shaped, 2040; iron sheets, black, 1193; steel sheets, black, 27,821; galvanized sheets, 6431; strip steel, cold-rolled, 3523; strip steel, hot-rolled, 4299; tinplate and tagger's tin, 50,907; terne plate (incl. long ternes), 616.

Structural shapes, plain, 21,243; structural shapes, fab., 14,011; frame and sashes, 144; sheet piling, 1710.

Rails, 60 lb per yard and over, 13,840; rails, less than 60 lb per yard, 384; rails, relaying, 3267; splice bars and tie plates 1578; frogs and switches, 233; railroad spikes, 375; railroad bolts, nuts, and washers, 1030; car wheels, tires and axles, 4117.

Seamless black pipe, 2041; seamless casing and oil line pipe, 18,206; seamless boiler tubes, 2957; welded black pipe, 4901; welded galvanized pipe, 2759; welded casing and oil line pipe, 8386; welded boiler tubes, 195; other pipe and fittings, 6058.

Plain wire, 5355; galvanized wire, 2738; barbed wire, 3329; woven wire fencing, 964; woven wire screen cloth, 453; wire rope and strand, 956; wire nails, 1763; other wire and manufactures, 2929.

Horseshoe nails, 4; tacks, 270; other nails, including staples, 715; bolts, nuts, rivets and washers, except railroad, 5167; forgings, 2487; horseshoes, 97.

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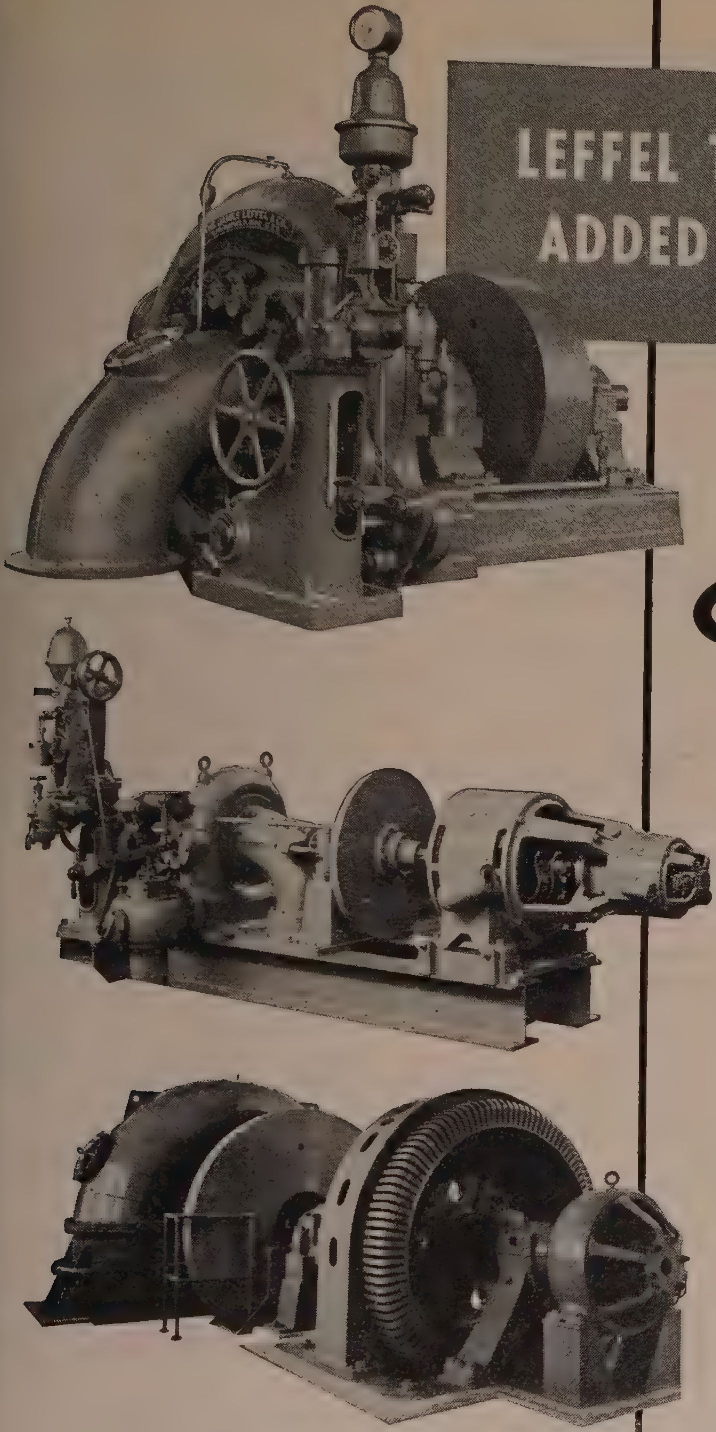

Hydraulic water turbines manufactured by The James Leffel & Company, Springfield, Ohio, requiring flywheels, are equipped with steel plate flywheels. By-Products Steel Co. is prepared to furnish flame-cut discs as thick as 25″, or as large as 195″; normalized, if desired.

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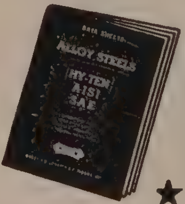

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ECA Funds Not Available For Insurance Premiums

Washington

• • • **No ECA funds** will be allocated in the future to cover the cost of insurance premiums for ECA-financed cargoes, Paul G. Hoffman, Economic Cooperation Administrator, has announced, in a further move to emphasize private trade practices in the ECA operations as directed by Congress. In the future insurance for cargoes will be handled by the exporter and importer as they desire, similar to export-import procedures that have prevailed in private trade transactions.

New procurement authorizations will not carry allocation of ECA funds for insurance premiums, but use of such funds authorized in past procurement authorizations will be honored, Hoffman said.

The new policy is as follows: (1) ECA will not finance insurance payments directly or indirectly. Losses of shipments will be regarded as a program expense and will require counterpart deposits by the country in local currency; (2) participating countries or their importers may insure as they desire, using any currency they choose for payment of premiums. ECA will not decide whether cargoes should nor should not be insured; (3) in the event of losses, no adjustment will be made in the local currency counterpart funds of the participating countries.

Recesses Basing-Point Suit

Washington

• • • **FTC attorneys** have closed their arguments in the 14-month-old price-fixing proceedings against the American Iron and Steel Institute and 101 steel producers.

Frank Hier, trial examiner, gave counsel for the steel companies until Oct. 22 to file motions to strike exhibits and testimony from the record. Such material has provided considerable controversy so far in the hearings.

Lynn C. Paulson, Federal counsel supporting the FTC complaint, has until Nov. 4 to answer the steelmakers' motions.

Steel companies' counsel contends that setting the hearings for Oct. 22 gives them too little time to prepare their motions. But Mr. Hier has refused them an extension.

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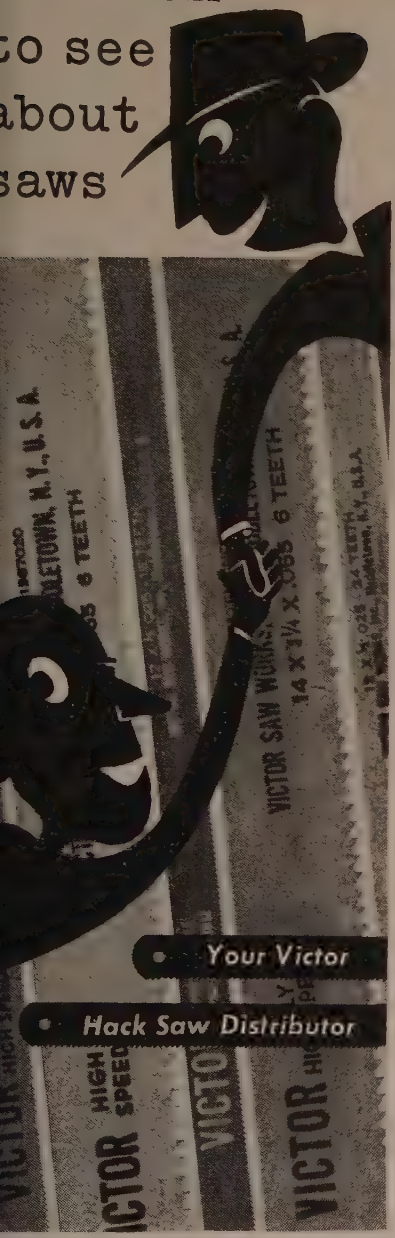
about
saws



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Munitions Board Plans Foundry Committee To Advise It on Industry

Washington

• • • **Organization** of a Foundry Industry Advisory Committee to the Munitions Board was effected at a meeting scheduled for Sept. 29 in the Pentagon. The committee will be composed of 20 members representing the various segments of the industry.

Included in the organizational work will be the setting up of at least a half dozen subcommittees to handle studies and problems pertaining to the specific phases of the foundry industry which the groups represent.

Currently, it is expected that subcommittees will be formed to represent gray iron casting, steel casting, cast iron pipe (both pressure and soil), brass and bronze casting, aluminum and magnesium, and malleable iron casting. It is likely that a technical subcommittee will be established as well.

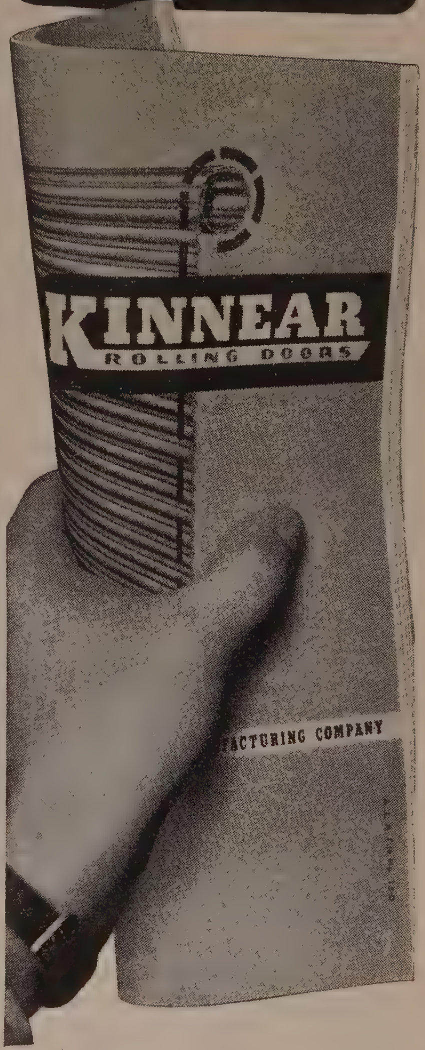
The subcommittees will be confronted with numerous matters for study with a view to making recommendations. Foremost among these is whether foundry capacity now existing would be sufficient should a new emergency develop in the near future and how to avoid bottlenecks in production.

This will involve deep study of existent plant capacity in the light of both past needs and new developments and requirements. It will also require surveys and estimates of new machinery requirements—for both additional production and the replacement of equipment which may now or soon will be worn out or obsolete.

Blueprints must also be worked out for sources and methods of obtaining raw materials for an accelerated industry in time of emergency. A more immediate problem is the study of the voluntary allocations program now being carried out by industry and government, its problems and effects.

Membership of the advisory committee as tentatively constituted includes General Donald Armstrong, now president of the U. S. Pipe & Foundry Co., president F. E. Shumann of the Lehigh Foundries, Inc.; J. H. Smith of General Motors Central foundry

Your Guide to Lower Door Costs



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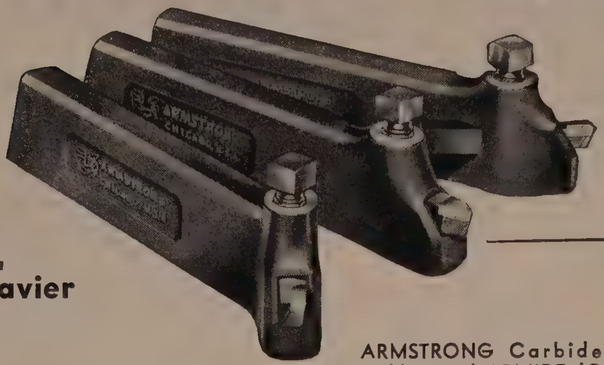

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division, and vice-president A. J. McDonald of American Steel Foundries.

Also, board chairman George W. Cannon of Campbell, Wyant & Cannon Foundry Co.; president C. L. Carter of Albion Malleable Iron Co.; vice-president F. Kermit Donaldson of Machined Steel Casting Co., and vice-president O. L. Earl of Acme Aluminum Foundry Co., Inc.

Also, president F. Ray Fleig of Smith Facing & Supply Co.; president John E. Galvin of Ohio Steel Foundry Co.; president Thomas Kaveny, Jr., of Herman Pneumatic Machine Co.; vice-president Max Kuniansky of Lynchburg Foundry Co.; and vice-president W. H. Moriarty of National Malleable & Steel Castings Co.

Also, president Thomas J. Pettus of National Bearings Metals Corp.; president W. L. Seelbach of Superior Foundry Co.; and president J. Donald Zaiser of Ampco Metal, Inc.

Also, E. W. Horlebein of Gibson & Kirk Co.; editor Frank G. Steinbach of *The Foundry;* David B. Shannon of Somerville Iron Works, and Fred S. Wellman of Wellman Bronze & Aluminum Co.

Scheduled First Meeting

Washington

• • • **First meeting of** the newly created Anglo-American Council on Productivity will be held in London during the week of Oct. 28, according to ECA Administrator Paul G. Hoffman.

Philip D. Reed, board chairman of General Electric Co., will be chairman of the American delegation. Other members of the American group include: Ernest R. Breech, executive vice-president of Ford Motor Co., Inc.; President Ira Mosher of Ira Mosher Associates, Inc., and former head of National Assn. of Manufacturers; President J. Spencer Love of Burlington Mills Corp.

Also Harvey W. Brown, international president of International Assn. of Machinists; president L. E. Buckmaster of United Rubber, Cork, Linoleum and Plastic Workers; and President Lee Minton of the Glass Bottle Blowers Assn. An additional representative of labor is yet to be named.

Basing Point Talks Held in Chicago By Wirerope Institute

Chicago

• • • **At a meeting** held here recently by the Wirerope Institute, Sumner S. Kittelle and George P. Lamb, New York and Washington attorneys, discussed the effect of the Federal Trade Commission's successful attacks on the multiple basing point system of selling. The full history and current developments of the Commission's crusade against basing point systems and how this affects national advertising and national publications received considerable attention.

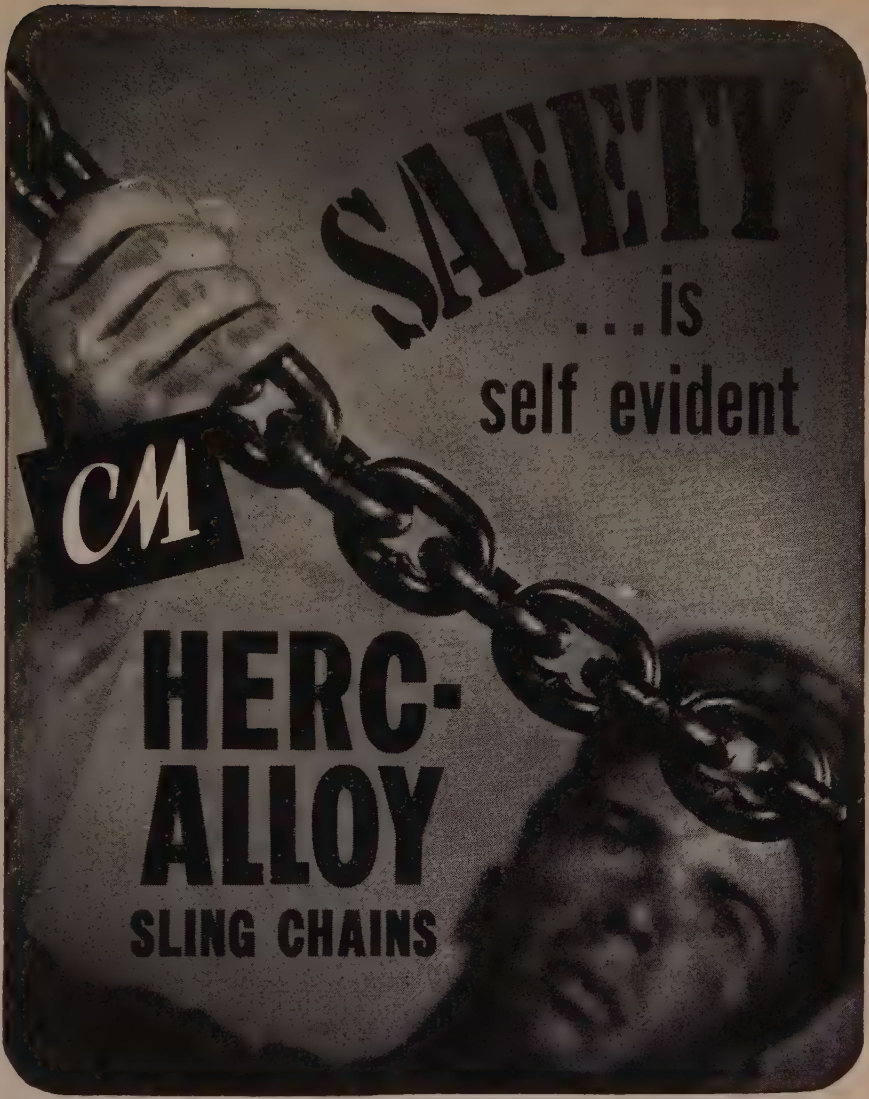
Mr. Lamb said, "Unless the Capehart sub-committee now investigating the impact of the cement and similar decisions on large and small businesses recommends legislation, which is passed by Congress to stem the tide of enforced f.o.b. mill pricing, American industry will be decentralized and balkanized so that national selling and national advertising and national publications, which derive their support from the latter, will disappear from the economic scene."

When the group asked what, if anything, could be done to prevent the imposition of enforced f.o.b. mill billing, the panel members suggested that they see that the Capeheart sub-committee receives full factual data from all branches of industry concerning the impact of this method of selling on individual companies. As a prerequisite to this the panel suggested that the members read up on the subject and collect all possible evidence before approaching the sub-committee.

Bendix Profit Increases

Detroit

• • • **Bendix Aviation Corp.** reported consolidated net income of $7,019,489 for 9 months ended June 30, 1948. During the same period a year ago Bendix earned $4,644,092. The report explained that the nventory reserve policy followed in he third quarter was not as liberal as that followed in the first two quarters.



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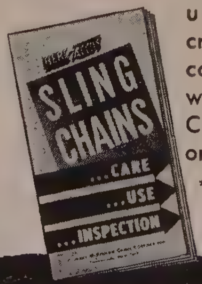

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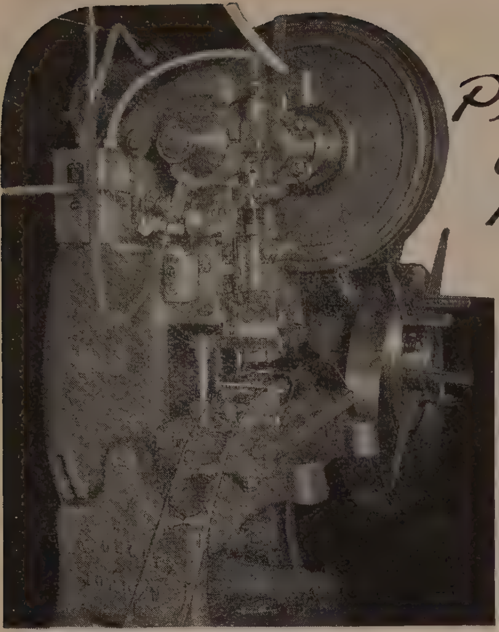

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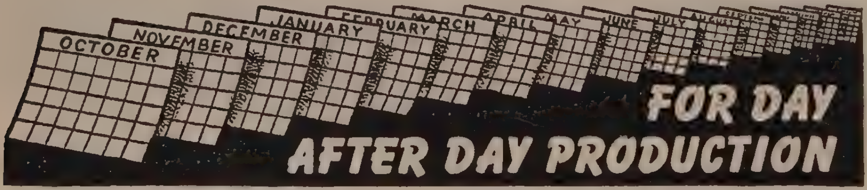

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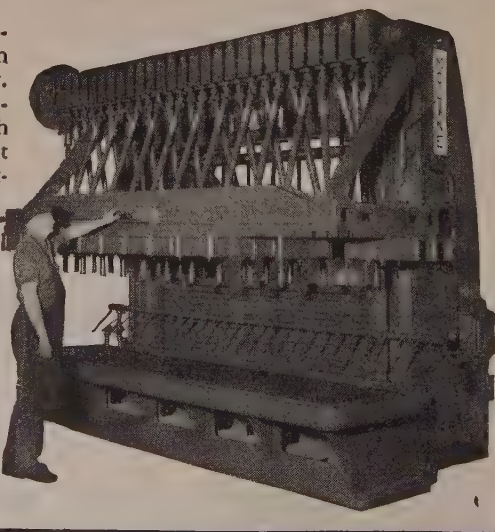


New Corporation Will Assist Participation In ECA by Members

New York

• • • **Incorporation papers** were filed recently at Albany, N. Y., marking the birth of the Foreign Recovery Activities Corp. FORAC, as it will be called, is not a government agency, but is the culmination of efforts by businessmen on both sides of the Atlantic to operate successfully through private enterprise and with the assistance of the Economic Cooperation Administration.

Sylvan Gotshal, 60 E. 42nd St., New York City, counsel for the Foreign Recovery Activities Corporation, who recently returned after five weeks of consultations with European businessmen who will be on the board of advisers, said "there is a great need for direct liaison at business levels and as a result we have set up an organization of representative industrialists, merchants and other interested parties in Europe and the United States to help fulfill the purposes of recovery and international trade as envisioned through the ECA."

"Little as we think we know about the full workings of ECA over here," Mr. Gotshall declared, "I found even less understanding, and even more need for information in Europe.

"**Our first objective** in the Foreign Recovery Activities Corp. will be to supply advisory services and the rapid exchange of information so that intelligent planning can be carried through by businessmen both here and abroad.

"Billions of dollars from governmental reservoirs are being unloosed for European recovery, which should irrigate international trade, but those who are to turn the golden flood to good purpose find themselves without the necessary rapid vessels of communication between Europe and the U. S. at operating business levels.

"We in FORAC are practical business men. We intend to exchange through our own channels data about the needs in Europe and our facilities to fulfill those needs over here. Then we will seek to establish through the ECA the possibilities of financing those transactions in terms of the dollar."

Foreign Recovery Activities is

an American corporation, with a European advisory board made up of businessmen and industrialists in Great Britain, France, Italy, Germany, Switzerland and the Benelux countries. Completion of the corporate organization, including election of directors and officers, will be effected in the near future, Mr. Gotshal said.

Made Atomic Division Chief

Washington

• • • **Dr. Robert Huntoon** has been appointed chief of the Atomic and Molecular Physics Div., according to the National Bureau of Standards, Dept. of Commerce. He will also serve as consultant to the Electronics Standards and Ordnance Development Laboratories of the Electronics Div.

Dr. Huntoon has received wide recognition in numerous scientific fields, including atomic-beam measurement, special amplifiers, atomic particle counting, electronic ordnance devices, the phasing of oscillators, and the study of the deuteron-deuteron nuclear reaction.

Dr. Huntoon joined the staff of the Bureau of Standards in 1941 and was one of the principal NBS scientists who designed and developed the proximity fuze. In 1944 his services were loaned to the War Department, where he served as expert consultant on proximity fuze and related problems in the Office of the Secretary of War. While acting in this capacity, he was sent to the European Theater of Operations as a member of the Advisory Specialists Group, United States Strategic Air Forces.

Train Uses New Bearings

Philadelphia

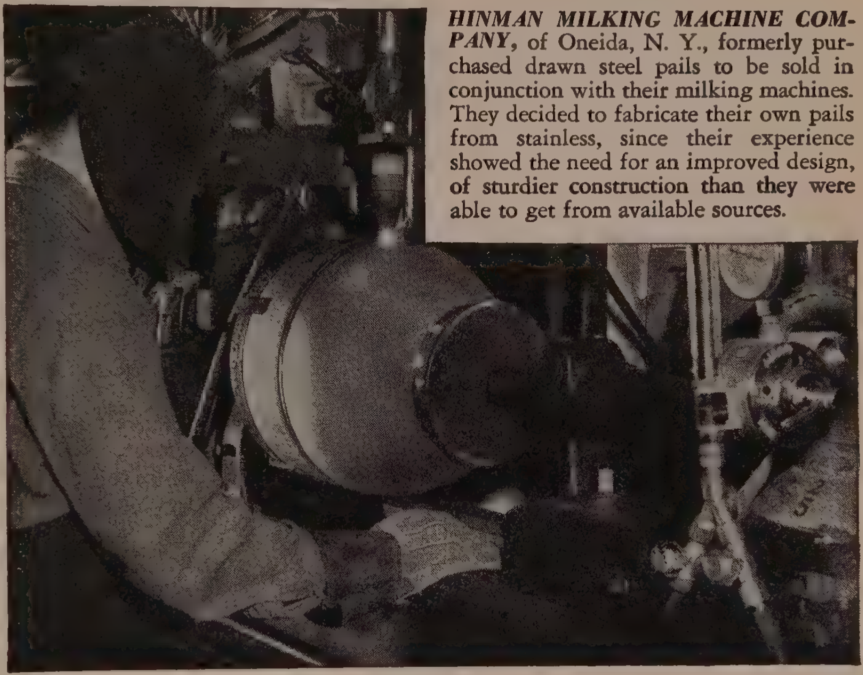
• • • **The latest type** anti-friction bearings will be used in the 90-car fleet of the Pacific Sunset Limited running between New Orleans and Los Angeles, according to Richard H. McDermott, president of SKF Industries.

Budd Co. here will build the fleet which will constitute five trains each made up of 15 stainless steel cars.

Delivery is scheduled for late next year. •

Machine Heliwelding turns out a better milk pail at lower cost

HINMAN MILKING MACHINE COMPANY, of Oneida, N. Y., formerly purchased drawn steel pails to be sold in conjunction with their milking machines. They decided to fabricate their own pails from stainless, since their experience showed the need for an improved design, of sturdier construction than they were able to get from available sources.



John View, Airco Technical Sales Representative, was consulted and he suggested the Heliwelding process with the Airco machine holder, using Airco Helium. After Heliwelding, only a small amount of polishing was necessary to finish the job, making the cans ready for shipment.

This method was so successful that the customer was able to produce a top quality pail with a tidy saving in money — and time.

• • • •

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Preparing of Special Steels for Porcelain Enameling Discussed

Chicago

• • • **Development of titanium** steels for porcelain enameling is important in preventing losses in manufacture, transportation and use of porcelain enameled products, according to F. R. Porter, Inland Steel Co. Mr. Porter will discuss the subject of special steels and their preparation for porcelain enameling at the tenth annual forum of the Porcelain Enamel Institute at the University of Illinois.

Much of the damage to porcelain enamel can be attributed to warped parts and thick enamel coatings, says Mr. Porter, and titanium-bearing enameling steel helps to solve both these problems. Titanium enameling steels are stable at enameling furnace temperatures, reducing warpage to a minimum. The average coating thickness of titanium enamels used with these steels is 0.0065 in. (compared with customary thicknesses of about 0.008 to 0.012 in. for 2 and 3-coat applications of some other enamels).

The preparation of any special steel for application of thin white coats directly to the metal must be thorough, according to Mr. Porter —"just as thorough as for electroplating." The enamel shop cleaning and pickling set-up must be adequate and well controlled, since, he says, "the attainment of satisfactory results is even more dependent upon what happens in the cleaning and pickling system than for ground coat-cover coat application."

In his talk before the PEI forum, Mr. Porter will describe in detail the proper treatment and use of titanium steels in porcelain enameling practice.

Celebrates Anniversary

Joliet, Ill.

• • • **The first coke** plant in the United States celebrated its 40th anniversary here at the Illinois Steel Co. recently, according to company spokesmen.

Coking operations began on Sept. 22, 1908 and from here the coal chemical industry as it is known today was developed.

The Illinois Steel Co. is an affiliate of the Carnegie-Illinois Steel Corp., a subsidiary of the U. S. Steel Corp.

Survey Shows Illness And Accidents Major Cause of Absenteeism

Washington

• • • **Illness and** off-the-job accidents accounted for three fifths of he absenteeism reported in 246 manufacturing plants in 1947, according to a survey conducted jointy by the Bureau of Labor Statistics, he Social Security Administration, nd the U. S. Public Health Service.

On the average, each worker in he reporting plants was absent 3.4 imes for a total of 9.6 days lost luring 1947. Illness and non-indusrial accidents accounted for 6.5 lays of absence per worker; peronal reasons, other than illness, accounted for 25 days; and industrial njuries accounted for 0.6 days per vorker.

Approximately 55 pct of the nonndustrial illness absences lasted nly 1 day and about 80 pct of the otal were terminated in less than days.

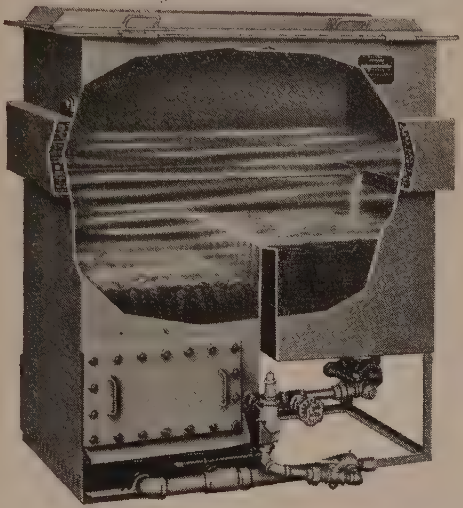
Women workers averaged 3 llness absences and 1.8 personal eason absences in comparison with .8 illness absences and 1.5 personal eason absences for men. Total time ost averaged 12.7 days for women nd 9 days for men, distributed as ollows; women, 8.7 days because f illness, 3.7 days for personal reaons, and 0.3 days because of inustrial injuries; men, 5.6 days beause of illness, 2.7 days for peronal reasons, and 0.7 days because f industrial injuries.

Steel Savings Seen

Detroit

• • **Shipments of** resistance velding equipment increased alnost half a million dollars during uly, according to the Resistance Velder Manufacturers' Assn. Memers of the association have indiated that backlogs of orders howed only a small decrease durng July.

Officials of the trade association ave reported that through redesign of certain products for resisance welding the amount of iron nd steel required has been reuced in some cases as much as pct.



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Canadian Production Broken Down by Products

Ottawa

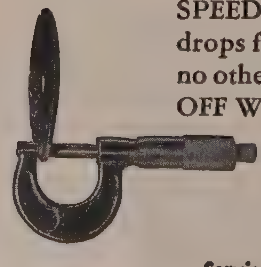
• • • Canada during 1947 had 2356 plants engaged in the manufacture of iron and steel and their products. Their gross production was valued at $1,779,718,604 at factory prices. Value of output was 26.7 pct above the total of $1,405,542,865 for 1946, according to the Dominion Bureau of Statistics.

Of the plants engaged in manufacture of iron and steel and their products in 1947, 1302 were located in Ontario; 546 in Quebec; 284 in British Columbia and the Yukon; 80 in Alberta; 72 in Nova Scotia; 112 in Manitoba; 42 in Saskatchewan; 37 in New Brunswick and 7 in Prince Edward Island.

Following are statistics relating to manufacture of iron and steel and their products in Canada for 1947 and 1946:

PRODUCTS	NUMBER OF PLANTS 1947	NUMBER OF PLANTS 1946	GROSS SELLING VALUE OF PRODUCTS AT WORKS 1947	GROSS SELLING VALUE OF PRODUCTS AT WORKS 1946
Pig iron, ferroalloys, steel and rolled products	59	59	$200,091,536	$153,082,616
Iron castings	227	219	100,766,654	82,278,070
Heating and cooking app.	101	95	43,802,104	35,979,749
Boilers, tanks and plate	47	44	35,036,034	26,710,902
Farm implements	58	51	88,711,124	63,238,542
Machinery	319	299	192,149,680	145,638,248
Automobiles	9	9	340,198,195	193,439,688
Automobile parts	131	124	107,395,855	93,428,899
Bicycles	9	7	4,078,539	3,686,374
Aircraft	12	16	45,421,927	36,210,906
Shipbuilding	77	79	96,891,665	91,851,460
Ry. rolling stock, etc.	38	37	148,239,397	162,159,521
Wire and wire goods	96	97	54,607,648	40,133,889
Sheet metal products	248	230	130,924,610	115,699,555
Hardware, cutlery, tool	285	276	80,889,502	73,059,549
Bridge, structural steel	26	25	51,292,520	40,122,691
Machine shops	504	460	22,464,142	20,452,712
Miscellaneous	284	229	36,037,472	28,369,490

The distribution of products by provinces was as follows: Ontario had $1,201.6 millions; Quebec, $362.5; Nova Scotia, $50.3; Manitoba, $55.8; British Columbia, $73.8; New Brunswick, $15.7; Saskatchewan, $3.4; Alberta, $15.9; and Prince Edward Island, $0.6 millions.



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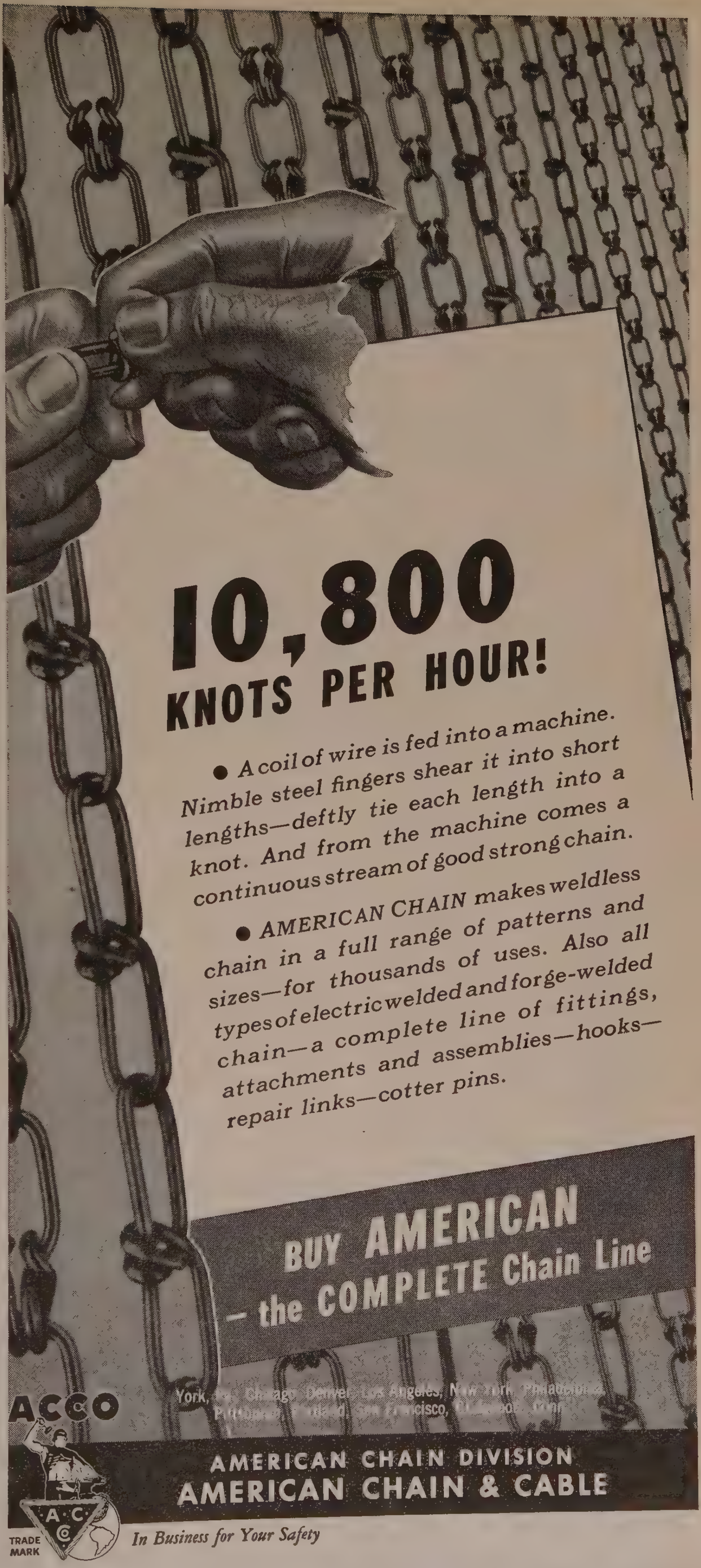
European Letter

(CONTINUED FROM 126)

ments put out to grass tired or deserving pensioners. There are honorable exceptions to this tendency, and some member countries have seen fit to keep their representation and the expenses they incur down to the minimum. Apart from the boards, the staffs of these two institutions are becoming unduly inflated. The Fund is reputed to have over 200 employees in its Research Department doing little more than is accomplished by a mere handful of people at the Bank of International Settlements at Basle. The Bank and Fund share a building, but nothing else. They have no common services. On the contrary, they tend to bid against one another for talent. As a result considerable duplication of effort is taking place within the four walls of the same building. What is worse, this inflated scale of administrative expenditure aggravates the dominant problem which these two institutions were formed to cure: the world's shortage of dollars. Their income is provided largely by the poor and the needy. It is they who have to take the Bank's loans and use the facilities of the Fund. Under the Keynes scheme, the excessive creditor would have been paying heavy interest on its large *bancor* balances and would thus have made his contribution to the running expenses of the Clearing Union. But no part of this idea survives and it is the deficit countries which provide the bulk of the income of both institutions. Their outlay, on the contrary, is almost wholly in the form of U. S. dollars, since they are situated in Washington and pay their salaries in dollars. There is therefore a very strong case to be made for a drastic curtailment in the budgets of these two international institutions. By such action they might even provide a salutory example to the even more white elephantine services and off-shoots of the United Nations whose mounting expenditure and increasing administrative inefficiency urgently need reform. Slimmed and stripped of their superfluous fat, the two Bretton Woods institutions would be in better shape to tackle the work for which they were intended and to fulfill the valuable functions that still lie before them.



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TRADE MARK

In Business for Your Safety

Usually Good September Business Spotty; Overall Volume Down

Industry Expects It Will Miss Arbitrary Goal of $300 Million This Year

• • • **Authoritative sources** in the trade indicated this week that a down swing may be on in the machine tool business and expressed doubts that the defense program orders will take up the slack.

September business was spotty, but the overall volume was down, according to trade observers, who pointed out that September is usually a good month for all segments of the machine tool industry. As matters stand now, there will have to be a rather substantial pickup in new firm orders, foreign and domestic, for the industry to reach its arbitrary goal of $300 million for this year, and indications are that $275 million will be about the best the industry will be able to do when all returns are in.

Prospects for 1949 are not very promising, and one source in the trade has already predicted that the machine tool industry will do rather well to reach $250 million in 1949. These predictions become even more sombre in view of the fact that they represent dollar volume, not unit sales. At the same time, past experience indicates the contract work, which is taking up slack in many a machine tool shop at the present time, usually tapers off with the machine tool business.

In Detroit there have been few significant machine tool developments during the past week aside from the usual crop of rumors about defense plans. Suppliers report the placing of several machines for the new Chevrolet transmission plant at Saginaw, although the bulk of the quotations are yet to be heard from. Some indications point to the possibility of $500,000 in new equipment for the Saginaw plant. Additional equipment is being rebuilt, it is reported. Still to be heard from is the tooling program for the new Packard transmission. This program has been expected to break for the past several months.

Informed sources report that little tooling will be placed in the new Ferguson Tractor plant here, since most of the parts are to be subcontracted and the new plant will be used for assembly only.

Among anticipated programs in the Detroit area is the tooling for the air cooled engine built by Continental, which was recently demonstrated here. These new engines, which have interchangeable parts and are built up in multiples, depending on the service, develop up to 1040 hp.

In Chicago, the machine tool market remains very quiet, with the trade hoping that the military or ECA programs will take hold quickly. So far most of the activity on these programs has been restricted to the paper stage.

Used machinery dealers believe that a sizable portion of foreign requirements for the ECA program could be met out of the present used and rebuilt machine tool pool. This pool of rebuilt machinery is quite large and in some types of machines the number of used rebuilt tools outnumbers the total inventory of new machines held in stock by manufacturers. Many of these rebuilt machines are standard types needed overseas. Used machinery dealers are claiming that we could ship more machines overseas quickly, and certainly much cheaper if good rebuilt used machinery was first applied whenever possible.

Sale of a war surplus industrial plant in Rockford, Ill., to Sundstrand Machine Tool Co., wartime operator and postwar lessee for $702,267 was announced last week by the Chicago office of War Assets Administration. Joseph A. Burke, deputy WAA regional director, said the sales amount was WAA's full fair value price for the plant, which is being used by the company for the manufacture and assembly of hydraulic transmission pumps and valves.

The plant contains 117,000 sq ft of floor space in two major buildings and approximately 6500 sq ft in four minor structures. Sale of the plant is subject to the provisions of the National Security Clause.

In Philadelphia, the machine tool market has not changed appreciably in recent weeks. Business can still be done in specialized tools, but the market for general purpose equipment is completely lacking. It was reported here that the trend toward the reduction of extra attachments to a bare minimum is being progressed rapidly by builders in an attempt to bring down their production costs.

Dealers in the Philadelphia area have been studying their marketing costs and one dealer has reported that the cost of making cold calls is $35 each. Another dealer is about to make use of junior salesmen in order to bring down the cost of inquiries and expand marketing contacts. Junior salesmen will be under the supervision of more experienced men and a chief objective of the program is to train new men for the field.

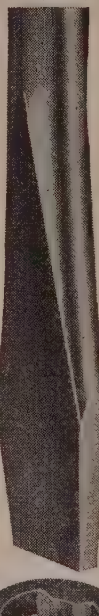
Elsewhere in the East, slowness of freight shipments is causing small tool manufacturers considerable embarrassment. Shipments are so slow that customers, if they want to take advantage of 2 pct 10 days, must pay for the tools before they receive shipment.

In Cleveland, Tell Berna, general manager, National Machine Tool Builders' Association, told a mechanical session of the AISE convention here that if the steel industry lets the machine tool industry down, the machine tool industry is stuck.

Warning AISE members that free enterprise is on trial, Mr. Berna added, the men who have been making decisions all these years on the basis of economic feasibility must now add the consideration of the public interest.

TYPE "A" ASSEMBLY BIT

COMMON SCREWDRIVER



Mr. President: Increased production is the key to lower costs. When presidents of a wide variety of other concerns say they have scored assembly production increases ranging from 15% to 50% . . . and when they credit these increases to change-over to CLUTCH HEAD . . . this modern screw should merit your investigation.

Mr. Engineer: Your selection of fasteners is important to the speed, safety and smooth operation of assembly . . . also to simplified field service, so vital to the "job performance" of your product. CLUTCH HEAD invites you to make a comparison on these points *with all other screws* on the market . . . recessed heads as well as slotted.

Mr. Purchasing Agent: Your experience tells you that the cost of screw APPLICATION is the factor that determines lower or higher FINAL COST in assembly. Users attest that CLUTCH HEAD'S exclusive features reduce costs with a 3-way step-up in production . . . faster, safer and easier driving; plus near-zero in tool maintenance cost.

Mr. Superintendent: Your main concern, and that of your foremen, is a smooth, safe, and steady tempo on the line. The high visibility of CLUTCH HEAD's recess is a speed factor, even with "green" operators; dead-center entry checks out driver canting and chewed-up heads; the non-tapered driving engagement (free from "ride-out") eliminates risk of skid damage and disposes of operator fatigue from fighting end pressure.

Gentlemen: *These and other exclusive advantages of CLUTCH HEAD will be apparent to you on examination. May we mail you screw assortment, sample Type "A" Bit, and illustrated Brochure? Check all the above features! also the ruggedness of the Type "A" Bit for longer continuous service and simple 60-second reconditioning; the value of the Lock-On for one-handed reaching; and CLUTCH HEAD'S basic recess design for common screwdriver operation.*

CLUTCH HEAD SCREWS

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7

NONFERROUS METALS

. . . News and Market Activities

Metal Supplies Still Seriously Short As Result of Strikes

Premium Prices Are Still Being Paid For Some Metals But Dropping Off Seen

New York

• • • **Lead, zinc and nearby** copper are still in serious short supply on the eve of the stockpiling meetings to be held by the Dept. of Commerce and the Munitions Board starting next week. The lead and zinc markets are still suffering from crippling effects of the strikes in the industries.

The strikes at the zinc producing properties of the American Zinc, Lead and Smelting Co. are still under way since mid-August. Recent information indicates no change in the possibility of any early adjustment. Although the strike at the lead producing properties of the St. Joseph Lead Co. has been ended, only 60 pct of customers' requirements can be supplied in October. Not until November will this producer be in a position to resume its normal position in the market.

Premium prices are still being paid for some tonnages of lead and zinc, although there are indications that the high prices that prevailed until recently are no longer being obtained freely. This has been due in part to larger imports coming in from Mexico. Producers of lead and zinc are no longer so concerned with the probability of higher prices growing out of the premium business.

There has been no change in the understanding of producers as to the applicability of the additional 15 pct Mexican export tax on ores, concentrates and metals. However, a recent dispatch from Mexico indicates that there will be a list of exemptions to the export tax published in another month. In the meantime, metals producers are bringing into this country Mexican lead and zinc ores, concentrates and metal and paying the tax. The additional cost of the tax comes out of the return to the Mexican shipper.

The zinc market is so tight that High Grade metal is difficult to obtain. Prime Western and Special High Grade have been in very short supply for many months.

Monthly Average Prices

• • • The average prices of the major nonferrous metals in September based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	23.50
Lake copper, Conn. Valley	23.625
Straits tin, New York	$1.03
Zinc, East St. Louis	15.00
Zinc, New York	15.65
Lead, St. Louis	19.30
Lead, New York	19.50

The demand for copper is very heavy for nearby delivery. Major producers have promised all their October copper. Most of them expect to be in a position to open their books for November sometime this week. Export demand is reported to have grown sharply in recent weeks, largely as the result of the ECA program as producers report that the inquiry comes principally from the countries embraced by the program. Wire mill demand is reported to be strong, and brass mill demand is improving.

During the week, the British Ministry of Supply advanced its selling prices for some nonferrous metals, effective Oct. 1, to British consumers. Copper was advanced £8 to £140 a ton, lead by £22 to £112, zinc by £17 to £92, and aluminum by £7 to £87.

Delivered to the British consumer, these prices at the exchange rate of $4.03 are as follows: Copper, 25.19¢; lead, 20.15¢; zinc, 16.55¢. When reduced by ocean freight, insurance, and rail transportation to the f.a.s. equivalent, these prices are not significantly above the currently quoted world market prices. The new British price for copper is about ¾¢ above the world market. There is no probability that this development will serve to advance the price of domestic copper, principally because the British Ministry would not purchase copper above the world market price. Market observers say that the copper being sold to British consumers was acquired by the ministry at prices well below the current domestic market levels. For some time the sales of copper to British consumers have been below the world market and the present move is believed to be an attempt to balance out the cost to the government.

° ° °

New York

• • • **Aluminum foundries** have come back in the ingot market in the last week or two, buying for first quarter delivery. This has caused a marked change in the strength of the market. Ingot prices have been increased by most producers and their scrap buying prices have also been raised. Dealers' buying prices for aluminum scrap grades have been advanced by ½¢ per lb. During most of the summer, there was little or no business in the aluminum ingot market.

Nonferrous Metals Prices

	Sept. 29	Sept. 30	Oct. 1	Oct. 2	Oct. 4	Oct. 5
Copper, electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	19.30	19.30	19.30	19.30	19.30	19.30

NONFERROUS METALS PRICES

Primary Metals

(*Cents per lb, unless otherwise noted*)

luminum, 99+%, 10,000 lb, freight allowed	16.00 to 17.00
luminum pig	15.00 to 16.00
ntimony, American, Laredo, Tex.	35.00
eryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
eryllium aluminum 5% Be, dollars per lb contained Be	$40.00
admium, del'd	$1.90
obalt, 97-99% (per lb)	$1.65 to $1.72
opper electro, Conn. Valley	23.50
opper, lake, Conn. Valley	23.625
old, U. S. Treas., dollars per oz.	$35.00
ndium, 99.8%, dollars per troy oz.	$2.25
ridium, dollars per troy oz.	$110 to $120
ead, St. Louis	19.30
ead, New York	19.50
agnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
agnesium, sticks, carlots	34.50
ercury, dollars per 76-lb flask, f.o.b. New York	$75 to $78
ickel, electro, f.o.b. New York	42.90
alladium, dollars per troy oz.	$24.00
latinum, dollars per troy oz.	$93 to $96
ilver, New York, cents per oz.	77.00
in, Grade A, New York	$1.03
inc, East St. Louis	15.00
inc, New York	15.65
irconium copper, 20 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(*Published prices, cents per lb delivered, carloads*)

5-5-5-5 ingot		
No. 115	19.50*	22.00
No. 120	19.00*	21.50
No. 123	18.50*	21.00
0-10-10 ingot		
No. 305	....	27.25
No. 315	....	24.25
3-10-2 ingot		
No. 210	....	33.00
No. 215	....	31.00
No. 245	24.00*	25.75
ellow ingot		
No. 405	15.75*	17.50
anganese bronze		
No. 421	....	23.00

* F.o.b. Philadelphia.

Aluminum Ingot

(*Cents per lb, lots of 30,000 lb*)

-5 aluminum-silicon alloys	
0.30 copper, max.	26.50–27.00
0.60 copper, max.	26.25–26.75
iston alloys (No. 122 type)	23.50–24.00
o. 12 alum. (No. 2 grade)	23.00–23.50
8 alloy	23.25–23.50
5 alloy	23.00–23.50
alloy	26.00–26.50
XS-679	23.50–24.00

Steel deoxidizing aluminum, notch-bar granulated or shot

rade 1—95 pct-95½ pct	23.75–24.75
rade 2—92 pct-95 pct	23.50–24.50
rade 3—90 pct-92 pct	22.75–23.50
rade 4—85 pct-90 pct	22.50–23.00

Electroplating Supplies

nodes

(*Cents per lb, freight allowed, in 500 lb lots*)

opper	
Cast, oval, 15 in. or longer	40⅛
Electrodeposited	34⅜
Rolled, oval, straight, delivered	37.34
Ball anodes	38⅜
ass, 80-20	
Cast, oval, 15 in. or longer	35⅞
nc, oval, 99.99	22.50
Ball anodes	20.50
ckel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
dmium	$2.00
lver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	84¼

emicals

(*Cents per lb, f.o.b. shipping point*)

pper cyanide, 100 lb drum	46.00
pper sulfate, 99.5 crystals, bbls.	9.10
ckel salts, single or double, 100 lb bags, frt. allowed	18.50
ckel chloride, 300 lb bbl.	24.50
ver cyanide, 100 oz. lots, per oz.	64⅝
dium cyanide, 96 pct domestic 100 lb drums	16.00
c sulfate, crystals, 22.5 pct, bags	5.90
c sulfate, 25 pct, granules, bbls. frt. allowed	7.90

Mill Products

Aluminum

(*Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed*)

Flat Sheet: 0.188 in., 2S, 3S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢; 24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.3¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.082 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.

Plate: ¼ in. and heavier: 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69¢; 23 to 25, 33.4¢ to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29¢ to 43¢; ¼ to ⅜ in., 30¢ to 46.5¢; 3/16 to 7/32 in., 32.5¢ to 53.5¢; 9/64 to 5/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 31¢.

Screw Machine Stock: Drawn, ⅛ to 11/32 in., 11S-T3, R317-T4, 48¢ to 84¢; cold-finished ⅜ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ⅜ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1 9/16 to 3 in., 11S-T3, 34.5¢ to 31.5¢; 2⅛ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.: 2S, 35¢ to 25.5¢; 52S, 48¢ to 31¢; 56S, 45.5¢ to 37¢; 17S-T4, 49¢ to 33.5¢; 61S-T4, 43.5¢ to 33¢; 75S-T6, 75¢ to 54¢.

Magnesium

(*Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb*)

Sheet and Plate: Ma, FSa, ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft. per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(*Cents per lb, f.o.b. mill*)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	..	40

Copper, Brass, Bronze

(*Cents per pound, freight prepaid on 200 lb*)

	Extruded Shapes	Rods	Sheets
Copper	36.78	....	37.18
Copper, hot-rolled	....	33.28	....
Copper, drawn	....	34.28	....
Low brass	38.07*	34.85	35.16
Yellow brass	36.76*	33.44	33.75
Red brass	38.55*	35.33	35.64
Naval brass	33.92	32.67	38.61
Leaded brass	....	28.30	....
Commercial bronze	39.29*	36.32	36.63
Manganese bronze	37.51	36.01	42.11
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	33.47	32.22	36.66
Everdur, Herculoy, Olympic, etc.	40.43	40.67	41.73
Nickel silver, 10 pct	....	46.42	44.20
Architectural bronze	....	....	32.33

* Seamless tubing.

Scrap Metals

Brass Mill Scrap

(*Cents per pound; add 1¢ per lb for shipments of 15,000 or more*)

	Heavy	Turnings
Copper	21⅛	20⅝
Yellow brass	18	17⅛
Red brass	19¾	19
Commercial bronze	19¾	19
Manganese bronze	17¾	16⅞
Leaded brass rod ends	17¾	

Custom Smelters' Scrap

(*Cents per pound, carload lots, delivered to refinery.*)

No. 1 copper wire	20.00
No. 2 copper wire	19.00
Light copper	18.00
Refinery brass	18.00*

* Dry copper content.

Ingot Makers' Scrap

(*Cents per pound, carload lots, delivered to producer.*)

No. 1 copper, wire	19.25
No. 2 copper, wire	18.25
Light copper	17.25
No. 1 composition	16.00
No. 1 comp. turnings	15.50
Rolled brass	12.00
Brass pipe	12.50
Radiators	13.25
Heavy yellow brass	11.50
Aluminum	
Mixed old cast	12.00
Mixed old clips	13.00
Mixed turnings, dry	11.00
Pots and pans	13.00
Low copper	14.00

Dealers' Scrap

(*Dealer's buying prices, f.o.b. New York in cents per pound*)

Copper and Brass

No. 1 heavy copper and wire	17½—17¾
No. 2 heavy copper and wire	16½—16¾
Light copper	15½—16
Auto radiators (unsweated)	10¾—11¼
No. 1 composition	13¼—13½
No. 1 composition turnings	12¾—13
Clean red car boxes	9¾—10
Cocks and faucets	9¾—10
Mixed heavy yellow brass	8¼— 8¾
Old rolled brass	9¾—10
Brass pipe	10½—11
New soft brass clippings	13¼—14
Brass rod ends	11 —11½
No. 1 brass rod turnings	10¼—10¾

Aluminum

Alum. pistons and struts	8 — 8½
Aluminum crankcases	9½—10
2S aluminum clippings	12 —12½
Old sheet & utensils	9½—10
Borings and turnings	5 — 5½
Misc. cast aluminum	9½—10
Dural clips (24S)	9½—10

Zinc

New zinc clippings	10 —10½
Old zinc	7¾— 8¼
Zinc routings	4 — 4½
Old die cast scrap	4½— 5

Nickel and Monel

Pure nickel clippings	22 —23
Clean nickel turnings	17 —18
Nickel anodes	22 —23
Nickel rod ends	21 —22
New Monel clippings	15½—16½
Clean Monel turnings	11 —12
Old sheet Monel	13 —14
Old Monel castings	10 —11
Inconel clippings	12 —13
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½— 7

Lead

Soft scrap lead	17½—18
Battery plates (dry)	11¼—11¾

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	82 —84
No. 1 pewter	65 —67
No. 1 auto babbitt	51 —53
Mixed common babbitt	14¾—15¼
Solder joints	19¾—20¼
Siphon tops	50 —52
Small foundry type	20 —20½
Monotype	19 —19½
Lino. and stereotype	18 —18½
Electrotype	16½—17
New type shell cuttings	15 —15½
Hand picked type shells	6½— 7
Lino. and stereo dross	9½—10
Electro dross	6½— 7

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Markets Maintain Even Keel; Backlogs Mount

New York

• • • **There has** been no significant change in the market this week pricewise nor from standpoint of demand. The market generally remains firm, although large sales were conspicuously absent.

Mills are making good progress at present in building up their inventories in view of the terrific shortage that was predicted months ago to have been in effect by this time. This condition has built up definite price resistances in some areas, but mills are still interested in buying at current price levels.

In Boston the melting grades returned to the price levels of a few weeks ago. Shipments moved briskly in that territory for a few weeks as mills paid higher-than-normal prices for scrap in an effort to build up some sort of a backlog in that area. Now that they have succeeded in getting a fair supply on hand, prices have fallen back to former levels.

Chicago market conditions remained on an even keel, although a few railroad specialties changed. Some moved upward a little and others down. Here a few railroads are holding back on railroad heavy melting while they determine whether to earmark all sales to the mills, sell everything on the open market or split sales half and half.

Foreign scrap continues to move into Buffalo in fair quantities and especially in that area where dealers and mills are deadlocked, dealers refuse to sell under current price levels while mills are sparring to punch out some transactions at lower prices. Feeling generally exists in most sections that the foreign scrap will aid considerably in providing the extra tonnages that will help immensely in building up winter backlogs, but that this source of supply will not be a factor in bringing about any downward trend in prices.

Mills are building up inventories, sales of large tonnages are missing in most areas but mills will have to keep right on buying all the scrap they can get their hands on right through the winter, probably at prevailing prices.

•

PITTSBURGH — Definite price resistance is evident here. While no price breaks have been reported, some big consumers of openhearth grades have good stocks on the ground. They appear uninterested in buying at current prices. Price resistance is particularly noticeable in specialty grades of steelmaking scrap with some consumers reporting their yards very comfortably stocked. These grades led off the previous price advances in openhearth scrap and observers are watching them carefully. Despite this it is still difficult for a buyer to step out and pick up any substantial tonnage of high grade scrap on the open market.

•

CHICAGO — With the exception of railroad specialties, the market continued on even keel last week. A few railroad prices changed; some went up, others down. Chicago roads are holding up the sale of railroad heavy melting trying to determine whether to earmark all of it to the mils, split the tonnages half to mills and half to highest bidders or sell it all at the highest price. Mill inventories continue to build up. Shipments remain good. As yet there are no indications that the price of openhearth scrap can be driven down.

•

PHILADELPHIA — The market was firm last week at the previously quoted prices on all grades. Mills are reported to be in a comfortable position for their current needs. The news of recent and pending imports continues to exert a psychological effect on the market, tending to relax the pressure for deliveries. Some easiness has appeared in foundry cast grades, but the change has not been sufficient to affect cast prices. Market factors believe that the closing of railroad lists at the end of last week should serve to test the market. Purchases above the market by some eastern buyers have not been large enough to have an important effect on the market.

•

CLEVELAND—There has been no significant change in the scrap market here or in the Valley for the past weeek. Demand is strong and supply weak. Mills are buying in small tonnages, not through choice, and temporarily the big tonnage buys look to be a thing of the past. Shipments to most consumers in the Cleveland-Valley area have been off a little bit the past few days, due in part to holidays. Despite the hullabaloo over foreign scrap, the feeling is growing that it will have little effect on price. Effect on quality may be more evident. Unless a large fixed tonnage of such proportions that it would seriously tax the available bottom for ocean shipments can be brought in every month, overseas scrap does not look to be the answer to the buyer's prayer.

DETROIT—There were no changes in Detroit scrap prices this week and scrap flow is picking up somewhat following settlement of the Briggs strike. Foundry grades continue strong but buying is spotty and usually in small lots. Energetic efforts of foundries to compensate for critical pig iron and coke conditions are expected to maintain the existing pressure on foundry scrap for some time to come.

•

BUFFALO—The market for steelmaking scrap was quiet but very tight in the wake of a runup of No. 2 steel to $44 on month-end short covering last week that cleaned up most of the loose ends. Dealers and mills were deadlocked as the former declined to sell under present conditions at current prices. Water shipments continued heavy with approximately 5000 tons of foreign and domestic scrap arriving by canal from New York during the week's week.

•

CINCINNATI — Foundry grades are somewhat weaker again this week, and price resistance was mounting, as a result of foundries dropping out of the market temporarily. Dealers complain that material is not moving into their yards, but on the other hand, brokers are rumoring a break in the market. Weakness in foundry grade prices is a possible indicator of this, but nobody is taking it seriously. Mills are still on formula and apparently able to get at least consumption back in shipments. There is considerable overgrading, a practice not confined exclusively to the Cincinnati district. One of the major consumers in this areaa remains out of the market.

•

NEW YORK—There was no change in the market again this week. Shipments moved slower because of holidays, but demand remained strong and the market was generally firm. German scrap was conceded to be having an effect on the market by adding considerably to the normal supply of some large mills. There are few signs of weakness in this market at present and what the future trend will be generally remains a point for conjecture.

•

BOSTON — Scrap prices, which for many weeks moved briskly at above normal prices, reaching as high as $38.90 as compared to $34.40, have now taken a decided drop. No. 1 heavy melting still sells for $36.40, but No. 2 heavy melting, No. 1 and 2 bundles and bushelings are quoted at $34.40. The keen competition for scrap is over and the mills with a good-sized backlog can obtain all they wish for at current prices. Chemical borings continue their upward surge and sell for as high as $39.50. A slight weakness in No. 1 machinery cast has not yet affected the price.

•

BIRMINGHAM — The shortage of cast is reflected in a price advance. No. 1 cupola is bringing $67 to $68. Former prices for that material ranged from $64 to $65. As much as $64 is being paid for mixed cast. Steel scrap, on the other hand, is weaker. Mills are eliminating equalization of freight rates which has resulted in some openhearth grades moving to other areas.

IRON AND STEEL SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to	$43.00
RR. hvy. melting	43.50 to	44.00
No. 2 hvy. melting	42.50 to	43.00
RR. scrap rails	57.50 to	58.50
Rails 2 ft and under	62.00 to	62.50
No. 1 comp'd bundles	42.50 to	43.00
Hand bdld. new shts.	42.50 to	43.00
Hvy. axle turn.	45.50 to	46.50
Hvy. steel forge turn.	45.50 to	46.50
Mach. shop turn.	37.50 to	38.00
Shoveling turn.	39.50 to	40.00
Mixed bor. and turn.	37.50 to	38.00
Cast iron borings	39.50 to	40.00
No. 1 mach. cast	69.50 to	70.50
Mixed yard cast	63.50 to	64.50
Hvy. breakable cast.	58.00 to	59.00
Malleable	76.00 to	77.00
RR. knuck. and cup.	60.00 to	61.00
RR. coil springs	60.00 to	61.00
RR. leaf springs	60.00 to	61.00
Rolled steel wheels	60.00 to	61.00
Low phos.	50.00 to	50.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.50 to	$42.00
No. 2 hvy. melting	41.50 to	42.00
No. 1 bundles	41.50 to	42.00
No. 2 dealers' bundles	41.50 to	42.00
Bundled mach. shop turn.	39.50 to	40.00
Galv. bundles	39.50 to	40.00
Mach. shop turn.	36.50 to	37.00
Short shov. turn.	38.50 to	39.00
Cast iron borings	37.50 to	38.00
Mix. borings and turn.	36.50 to	37.00
Low phos. hvy. forge	51.00 to	52.00
Low phos. plates	49.00 to	50.00
No. 1 RR. hvy. melt.	44.25 to	48.50
Rerolling rails	66.00 to	68.00
Miscellaneous rails	61.00 to	62.00
Angles & splice bars	56.00 to	56.50
Locomotive tires, cut	58.00 to	59.00
Cut bolster & side frames	51.00 to	53.00
Standard stl. car axles	77.00 to	78.00
No. 3 steel wheels	54.00 to	55.00
Couplers and knuckles	55.00 to	56.00
Rails, 2 ft and under	63.00 to	66.00
Malleable	82.00 to	83.00
No. 1 mach. cast.	69.00 to	70.00
No. 1 agricul. cast.	63.00 to	65.00
Heavy breakable cast.	62.00 to	63.00
RR. grate bars	66.00 to	67.00
Cast iron brake shoes	58.00 to	60.00
Cast iron car wheels	62.00 to	63.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	$40.00 to	$41.00
No. 2 hvy. melting	40.00 to	41.00
No. 1 bundles	40.00 to	41.00
No. 2 bundles	40.00 to	41.00
Mach. shop turn.	35.00 to	36.00
Shoveling turn.	37.00 to	38.00
Cast iron borings	36.00 to	37.00
Mixed bor. & turn.	35.00 to	36.00
Low phos., 18 in. under	48.00 to	49.00
No. 1 cupola cast.	65.00 to	66.00
Hvy breakable cast	59.00 to	60.00
Rails 18 in. and under	61.00 to	63.00
Rails random length	56.00 to	57.00
Drop broken	69.00 to	70.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.40 to	$36.40
No. 2 hvy. melting	....	34.40
Nos. 1 and 2 bundles	....	34.40
Bushelings	....	34.40
Shoveling turn.	....	31.40
Machine shop turn.	....	29.40
Mixed bor. and turn.	....	29.40
Cl'n cast chem. bor.	38.00 to	39.50
No. 1 machinery cast.	64.00 to	65.00
No. 2 machinery cast.	59.00 to	60.00
Heavy breakable cast.	53.50 to	54.50
Stove plate	52.50 to	53.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	....	$38.00
No. 2 hvy. melting	....	38.00
No. 1 bundles	....	38.00
New busheling	....	38.00
Flashings	....	38.00
Mach. shop turn.	$32.50 to	33.00
Machinery cast	62.00 to	64.00
Mixed yard cast	57.00 to	59.00
Shoveling turn.	34.50 to	35.00
Cast iron borings	33.50 to	34.00
Mixed bor. & turn.	34.50 to	35.00
Low phos. plate	42.50 to	43.00
Heavy breakable cast.	53.00 to	57.00
Stove plate	56.00 to	57.00
Automotive cast.	63.00 to	65.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$44.50 to	$45.50
No. 2 hvy. melting	41.00 to	41.50
No. 1 bundles	44.50 to	45.50
No. 2 bundles	41.00 to	41.50
Mach. shop turn.	37.00 to	38.00
Shoveling turn.	38.50 to	39.00
Mixed bor. and turn.	36.50 to	37.50
Clean cast chemical bor.	43.00 to	45.00
No. 1 machinery cast.	65.00 to	66.00
No. 1 mixed yard cast.	61.00 to	62.00
Hvy. breakable cast	62.00 to	63.00
Clean auto cast.	65.00 to	66.00
Hvy. axle forge turn.	46.00 to	47.00
Low phos. plate	51.00 to	52.00
Low phos. punchings	51.00 to	52.00
Low phos. bundles	48.00 to	49.00
RR. steel wheels	54.00 to	55.00
RR. coil springs	54.00 to	55.00
RR. malleable	78.00 to	80.00
Cast iron carwheels	68.00 to	70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$43.00 to	$44.00
No. 2 hvy. melting	40.00 to	41.00
Bundled sheets	40.00 to	41.00
Mach. shop turn.	35.00 to	36.00
Shoveling turnings	37.00 to	38.00
Locomotive tires, uncut	49.00 to	50.00
Mis. std. sec. rails	54.00 to	56.00
Steel angle bars	54.00 to	55.00
Rails 3 ft and under	58.00 to	60.00
RR. steel springs	51.00 to	52.00
Steel car axles	56.00 to	57.00
Grate bars	59.00 to	60.00
Brake shoes	59.00 to	60.00
Malleable	73.00 to	75.00
Cast iron car wheels	60.00 to	61.00
No. 1 machinery cast.	66.00 to	68.00
Hvy. breakable cast.	59.00 to	60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	....	$40.00
No. 2 hvy. melting	....	40.00
No. 2 bundles	....	40.00
No. 1 bunsheling	..	40.00
Long turnings	$32.00 to	33.00
Shoveling turnings	35.00 to	36.00
Cast iron borings	....	29.50
Bar crops and plate	44.00 to	45.00
Structural and plate	44.00 to	45.00
No. 1 cupola cast.	67.00 to	68.00
Stove plate	64.00 to	65.00
No. 1 RR. hvy. melt.	....	41.00
Steel axles	51.00 to	52.00
Scrap rails	44.00 to	45.00
Rerolling rails	57.00 to	60.00
Angles & splice bars	51.00 to	53.00
Rails 3 ft & under	52.00 to	55.00
Cast iron carwheels	57.00 to	58.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to	$43.00
No. 2 hvy. melting	42.50 to	43.00
Mach. shop turn.	37.50 to	38.00
Short shov. turn.	39.00 to	40.00
Cast iron borings	38.00 to	39.00
Low phos.	47.50 to	48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.50 to	$39.00
No. 2 hvy. melting	....	37.00
No. 2 bundles	....	37.00
Mach. shop turn.	31.50 to	32.00
Mixed bor. & turn.	31.50 to	32.00
Shoveling turnings	33.50 to	34.00
Machinery cast.	59.00 to	60.00
Mixed yard cast	57.00 to	58.00
Heavy breakable cast.	56.00 to	57.00
Charging box cast.	56.00 to	57.00
Unstrp. motor blks.	53.50 to	54.50
Cl'n cast chem. bor.	38.50 to	39.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$47.00 to	$49.00
No. 2 hvy. melting	41.75 to	42.25
No. 1 bundles	41.75 to	42.25
No. 2 bundles	41.75 to	42.25
No. 1 busheling	41.75 to	42.25
Mach. shop turn.	36.75 to	37.25
Shoveling turn.	37.25 to	38.00
Cast iron borings	37.75 to	38.25
Mixed bor. and turn.	36.75 to	37.25
Clean auto. cast.	65.00 to	66.00
Mixed cupola cast.	65.00 to	66.00
Stove plate	64.00 to	65.00
RR. malleable	70.00 to	75.00
Small indus. malleable	47.00 to	49.00
Low phos. plate	48.00 to	50.00
Scrap rails	58.00 to	60.00
Rails 3 ft & under	63.00 to	64.00
RR steel wheels	58.00 to	60.00
RR. coil & leaf spgs.	58.00 to	60.00
RR. knuckles & coup.	58.00 to	60.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to	$42.50
No. 2 hvy. melting	42.00 to	42.50
No. 1 bundles	42.00 to	42.50
No. 1 busheling	42.00 to	42.50
Drop forge flashings	42.00 to	42.50
Mach. shop turn.	37.00 to	37.50
Shoveling turn.	38.50 to	39.50
Steel axle turn.	42.00 to	42.50
Cast iron borings	37.50 to	38.50
Mixed bor. & turn.	36.50 to	37.50
Low phos. 2 ft and under	47.00 to	47.50
No. 1 machinery cast	72.00 to	74.50
Malleable	79.00 to	81.00
RR. cast.	76.00 to	77.00
Railroad grate bars	60.00 to	62.00
Stove plate	61.00 to	63.00
RR. hvy. melting	43.00 to	43.50
Rails 3 ft and under	63.50 to	64.50
Rails 18 in. and under	65.00 to	66.00

SAN FRANCISCO

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	....	$27.50
No. 2 hvy. melting	....	27.50
No. 2 bales	....	27.50
No. 3 bales	....	24.50
Mach. shop turn.	....	18.00
Elec. fur. 1 ft under	$36.00 to	40.00
No. 1 cupola cast.	50.00 to	51.00
RR. hvy. melting	....	28.50
Rails	....	29.00

LOS ANGELES

Per gross ton, f.o.b. shipping point:

No. 1 hvy. melting	....	$27.50
No. 2 hvy. melting	....	27.50
No. 1 bales	....	27.50
No. 2 bales	....	27.50
No. 3 bales	....	24.50
Mach. shop turn.	....	20.00
No. 1 cupola cast.	$45.00 to	50.00
RR. hvy. melting	....	28.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	$27.50 to	$30.00
Elec. fur. 1 ft and under	36.50 to	40.00
No. 1 cupola cast.	50.00 to	56.00
RR. hvy. melting	....	28.50

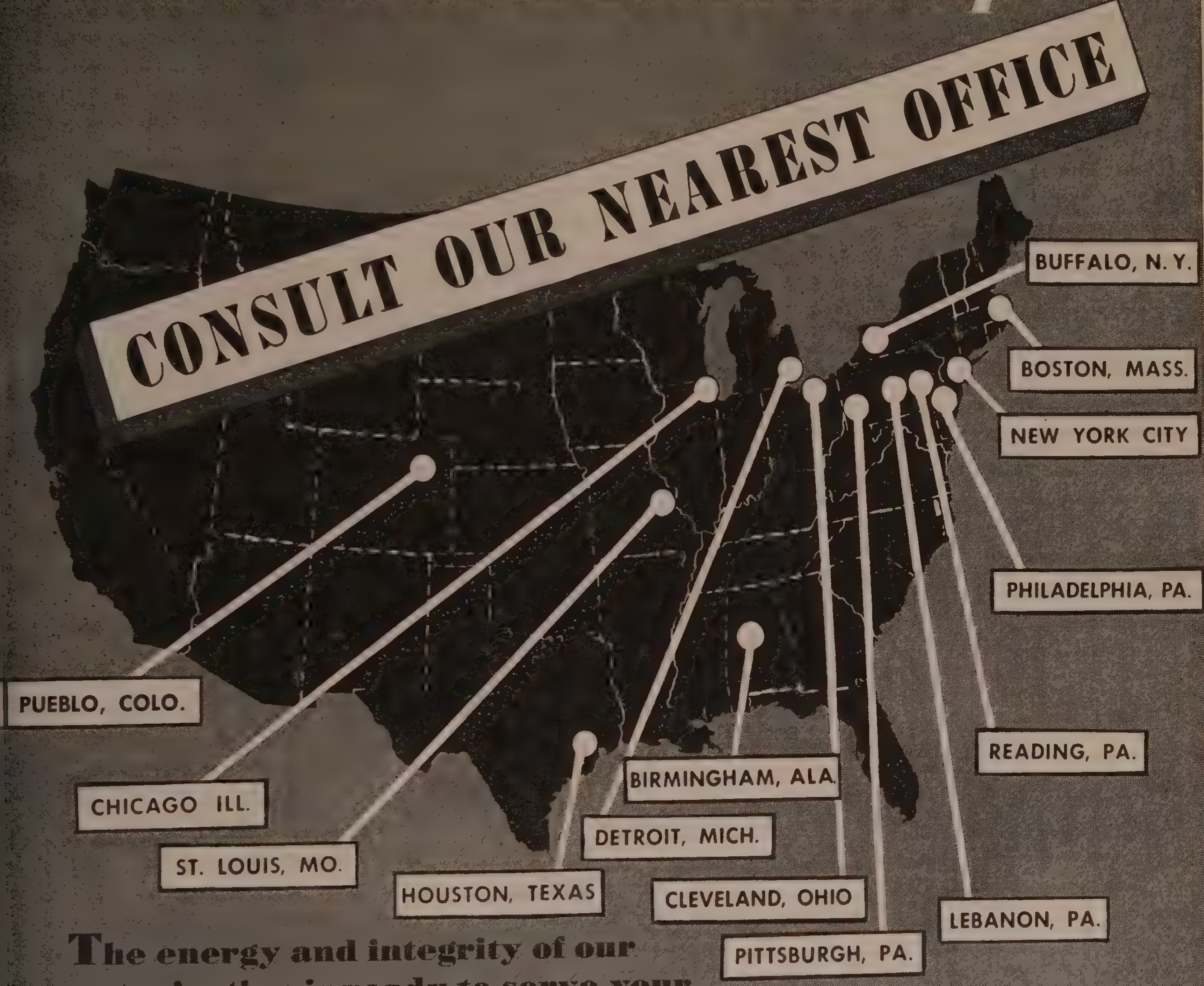
HAMILTON, ONT.

Per gross ton delivered to consumer:
Cast grades f.o.b. shipping point:

Heavy melting		$22.00*
No. 1 bundles		22.00*
No. 2 bundles		21.50*
Mechanical bundles		20.00*
Mixed steel scrap		19.00*
Mixed borings and turnings		17.00*
Rails, remelting		23.00*
Rails, rerolling		26.00*
Bushelings		17.00*
Bushelings, new fact, prop'd		21.00*
Bushelings, new fact, unprop'd		16.00*
Short steel turnings		17.00*
No. 1 cast	$42.00 to	46.00
No. 2 cast	35.00 to	37.00

*Ceiling Price.

For the Sale or Purchase of Iron and Steel Scrap...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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Oct. 5, 1948	Sept. 28, 1948	Sept. 7, 1948	Oct. 7 1947
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.42	3.42	3.42	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stains C-R strip (No. 302)	33.00	33.00	33.25	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.80	$6.80	$6.80	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.50	28.50	28.25	26.00
Wrought iron bars	9.50	9.50	9.50	7.15
Wire: (cents per pound)				
Bright wire	4.256	4.256	4.256	3.55
Rails: (dollars per 100 lb)				
Heavy rails	$3.20	$3.20	$3.20	$2.75
Light rails	3.55	3.55	3.55	3.10
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$52.00	$52.00	$52.00	$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†
Wire rod and Skelp: (cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton

Pig Iron: (per gross ton)	Oct. 5, 1948	Sept. 28, 1948	Sept. 7, 1948	Oct. 7 1947
No. 2, foundry, Phila.	$51.56	$51.56	$49.56	$41.22
No. 2, Valley furnace	**45.00**	43.50	43.50	36.50
No. 2, Southern Cinti	49.47	49.47	49.47	39.75
No. 2, Birmingham	43.38	43.38	43.38	34.88
No. 2, foundry, Chicago†	**46.00**	43.00	43.00	36.00
Basic del'd Philadelphia	50.76	50.76	48.76	40.72
Basic, Valley furnace	**44.50**	43.00	43.00	36.00
Malleable, Chicago†	**46.50**	43.50	43.50	36.50
Malleable Valley	**45.00**	43.50	43.50	36.50
Charcoal, Chicago	73.55	69.55	69.55	49.49
Ferromanganese‡	161.71	145.00	145.00	145.00

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† The switching charge for delivery to foundries in the Chicago district is $1 per ton.

‡ Average of U. S. prices quoted on Ferroalloy page.

* Revised.

Scrap (per gross ton)	Oct. 5, 1948	Sept. 28, 1948	Sept. 7, 1948	Oct. 7 1947
Heavy melt'g steel, P'gh.	$42.75	$42.75	$42.75	$38.00
Heavy melt'g steel, Phila.	45.00	45.00	45.00	37.50
Heavy melt'g steel, Ch'go	41.75	41.75	41.75	38.75
No. 1, hy, comp. sh't, Det.	38.00	38.00	38.00	34.50
Low phos. Young'n.	47.75	47.75	47.75	44.50
No. 1, cast, Pittsburgh	70.00	70.00	65.00	43.00
No. 1, cast, Philadelphia	65.50	65.50	65.50	47.50
No. 1, cast, Chicago	*69.50*	71.00	72.00	49.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke prompt	$15.00	$15.00	$15.00	$12.00
Foundry coke, prompt	17.00	17.00	17.00	13.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	$1.03	$1.03	$1.03	80.00
Zinc, East St. Louis	15.00	15.00	15.00	10.50
Lead, St. Louis	19.30	19.30	19.30	14.80
Aluminum, virgin	16.00	16.00	16.00	15.00
Nickel, electrolytic	42.90	42.90	42.90	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	35.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Oct. 5, 1948	3.75255¢ per lb.	$46.07 per gross ton	$43.16 per gross ton
One week ago	3.75255¢ per lb.	$45.07 per gross ton	$43.16 per gross ton
One month ago	3.75255¢ per lb.	$44.66 per gross ton	$43.16 per gross ton
One year ago	3.19541¢ per lb.	$36.93 per gross ton	$38.08 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1948	3.75325¢ July 27	3.22566¢ Jan. 1	$46.07 Oct. 5	$39.58 Jan. 6	$43.16 July 27	$39.75 Mar. 9
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.83599¢ Dec. 31	2.54490¢ Jan 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	1961 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas													
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Fr'isco, LosAngeles	Fontana
INGOTS Carbon forging	$50.00														
Alloy	$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, rerolling[12]	$52.00				$52.00	$52.00	(per net ton)						$52.00		
Carbon forging billets	$61.00	$61.00	$61.00	$61.00	$61.00	$61.00	(per net ton)						$61.00		
Alloy	$63.00	$63.00				$63.00	(Bethlehem, Canton, Massillon = $63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren =3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.40			Worcester 3.70		3.40	4.05[13] 4.10[14]	
SHEETS Hot-rolled[6]	3.25 to 3.30	3.25	3.25	3.25–3.30	3.25	3.25	3.25	3.25		Warren, Ashland =3.25		3.45		3.95[15]	5.65
Cold-rolled[1]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20			
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton =4.40	4.40	Ashland =4.40			5.15[15]	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70			
Long ternes[2] (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled[3]	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren =3.25	3.45		4.00 to 4.25	5.90
Cold-rolled[4]	4.00	4.25		4.00	4.00	4.00	4.00	4.00		New Haven 4.00 Warren=4.00 to 4.25		4.20 to 4.50			7.10
TINPLATE Cokes, 1.50 lb.[5] base box	6.80	6.80	6.80		6.90			6.90	7.00	Warren, Ohio =6.80				Pittsburg, Cal.=7.55	
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct $1.00. 80¢ and 60¢ respectively from 1.50 lb. coke base box price														
TERNES MFG., special coated	Deduct 90¢ from 1.50 lb. coke base box price														
BLACKPLATE CANMAKING 55-70 lb, 75 95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb. coke base box price														
BLACKPLATE, h.e., 29 ga.[10]	4.75	4.75	4.75					4.85							
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton =3.35		3.35	4.05 to 4.10	5.30
Reinforcing (billet)[7]	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton =3.35		3.35	4.05 to 4.10	5.30
Cold-finished[8]	3.95 to 4.00	4.00	4.00	4.00			4.00					4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon=3.75					3.75	4.80[14]	5.50
Alloy cold-drawn								Massillon=4.65							
PLATE Carbon steel[11]	3.40 to 3.60	3.40	3.40	3.40	3.40 Consh	3.45 ohocken	3.40 =3.95	Coatesville=3.75, Claymont=3.95 Geneva, Utah=3.40, Harrisburg=6.50				3.65	3.45	4.30[16]	5.80
Floor plates	4.55	4.55		4.55				Conshohocken =4.55							
Alloy	4.40	4.40						Coatesville=5.10							
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30	Bethlehem=3.30, Geneva, Utah=3.25						3.30	3.85 to 4.30	5.75
MANUFACTURERS' WIRE[9] Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.15	4.25	Duluth=4.15, Worcester=4.45				4.15	5.10[13]	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester=5.50 New Haven, Trenton=5.50				5.20	Duluth= 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05									

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel		Straight Chromium			
	No. 302	No. 304	No. 410	No. 430	No. 442	No. 446
Billets, forging	26.50	27.75	21.50	21.75	25.00	30.25–30.75
Bars, hot-rolled	28.50	30.00	23.00	23.50	27.00	32.50–33.00
Bars, cold-finished	28.50	30.00	23.00	23.50	27.00	32.50–33.00
Plates	32.00	34.00	26.00	26.50	31.00	35.50–39.00
Shapes, structural	28.50	30.00	23.00	23.50	27.00	32.50–33.00
Sheets	37.50	39.50	33.00	35.50	39.50	50.00
Strip, hot-rolled	25.75	27.75	21.25	21.75	28.50	45.00
Strip, cold-rolled	33.00	35.00	27.00	27.50	39.00	60.00
Wire, cold-drawn	28.50	30.00	23.00	23.50	27.00	32.50–33.00

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed.

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	$1.42
18	4	2	—	—	$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium	52¢
Oil harden manganese	29¢
Special carbon	26.5¢
Extra carbon	22¢
Regular carbon	19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$3.20
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

	Base per lb
Cut spikes	5.35¢
Screw spikes	8.00¢
Tie plates	4.05¢
Tie plates, Pittsburgh, Calif.*	4.20¢
Track bolts	7.50¢
Track bolts, heat treated, to railroads	8.50¢

*Seattle, add 30¢.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless clad		
No. 304, 20 pct, f.o.b.		
Coatesville, Pa.	*27.00	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa.		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville.	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville.	29.00	
Alumnized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.	....	9.25

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* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	*Pittsburgh, Calif.*
Standard & coated nails*	103	123
Galvanized nails*	103	123
Woven wire fence†	109	132
Fence posts, carloads††	114	...
Single loop bale ties	106	130
Galvanized barbed wire**	123	143
Twisted barbless wire	128	...

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* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*Pittsburg, Calif.*
Annealed fence wire‡	$4.80	$5.75
Annealed, galv. fencing‡	5.25	6.20
Cut nails, carloads‡‡	6.75	....

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‡ Add 30¢ at Worcester; 10¢ at Sparrows Pt.
‡‡ Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.65
Sheets									
Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	4.95	5.25
Cold-rolled	6.05	6.05	6.05	....	6.05	6.05	6.05	6.05	6.35
Galvanized	....	6.75	....	....	....	6.75	....	....	....
Strip									
Hot-rolled	4.95	4.95	4.95	....	4.95	4.95	4.95	4.95	5.25
Cold-rolled	....	....	6.05	....	....	6.05	6.05	....	6.35
Shapes	....	4.95	....	....	4.95	5.05	4.95	....	....
Beams	....	4.95	....	....	....	....	....	....	....
Bars									
Hot-rolled	5.10	5.10	5.10	....	5.10	5.10	5.10	....	5.40
Bar shapes	....	5.10	....	....	5.10	5.10	5.10	....	....

PIPE AND TUBING

Base discounts, f.o.b. mills,
steel buttweld and seamless.
Base price, $200.00 per net ton.

Standard, threaded and coupled

Steel, buttweld*	*Black*	*Galv.*
¾-in.	46	26½
1-in.	48½	29½
1¼-in.	49	30
1½-in.	49½	30½
2-in.	50	31
2½ and 3-in.	50½	31½
Wrought Iron, buttweld		
½-in.	+20½	+50
¾-in.	+10½	+39
1 and 1¼-in.	+ 4½	+30
2-in.	— 1½	+26½
2-in.	— 2	+26
Steel, lapweld		
2-in.	39½	20
2½ and 3-in.	43½	24
3½ to 6-in.	45½	26
Steel, seamless		
2-in.	38½	19
2½ and 3-in.	41½	22
3½ to 6-in.	43½	24
Wrought Iron, lapweld		
2-in.	+ 7½	+34
2½ to 3½-in.	+ 5	+29½
4-in.	list	+23½
4½ to 8-in.	+ 2	+25

Extra Strong, plain ends

Steel, buttweld		
½-in.	41	22
¾-in.	45	26
1-in.	47	29
1¼-in.	47½	29½
1½-in.	48	30
2-in.	48½	30½
2½ and 3-in.	49	31
Wrought Iron, buttweld		
½-in.	+16	+44
¾-in.	+ 9½	+37
1 to 2-in.	— 1½	+26
Steel, lapweld		
2-in.	38½	20
2½ and 3-in.	43½	25
3½ to 6-in.	45½	26
Steel, seamless		
2-in.	37½	19
2½ and 3-in.	41½	23
3½ and 6-in.	45	26½
Wrought Iron, lapweld		
2-in.	+ 4½	+30½
2½ to 4-in.	— 5	+19
4½ to 6-in.	— 1	+23½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

* F.o.b. Fontana prices average 17 points lower discount (higher price) on black, 14 points on galvanized.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD	Gage	Seamless		Electric Weld	
in in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	19.18	22.56	18.60	21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	$106.70
6 to 24-in., del'd N. Y.	103.50 to 108.40
6 to 24-in., Birmingham	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	120.30

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
½ in. & smaller x 6 in. & shorter	35
9/16 & ⅝ in. x 6 in. & shorter	37
¾ in. & larger x 6 in. & shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	35
9/16 to 1 in. inclusive	34
1⅛ to 1½ in. inclusive	32
1⅝ in. and larger	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts

	USS	SAE
7/16 in. and smaller	..	41
½ in. and smaller	38	..
½ in. through 1 in.	..	39
9/16 in. through 1 in.	37	..
1⅛ in. through 1½ in.	35	37
1⅝ in. and larger	28	..

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate	$61.75
In bulk	70.00

Large Rivets

	(½ in. and larger) *Base per 100 lb*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller) *Pct Off List*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages)	*Pct Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
⅝ to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

Effective CaF, Content:	*Base price per net ton*
70% or more	$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports)*

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe.	90.0¢ to $1.75
Aluminum	30.00¢
Antimony	47.67¢
Brass, 10 ton lots	27.25 to 37.25¢
Copper, electrolytic	33.625¢
Copper, reduced	34.25¢
Cadmium	$2.55
Chromium, electrolytic, 99% min.	$3.50
Lead	25.80¢
Manganese	55.00¢
Molybdenum, 99%	$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.155
Tungsten. 95%, 99%	$2.90
Zinc, 10 ton lots	17.25 to 30.00¢

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $18.00
Foundry, Byproduct	
Chicago, del'd	$23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	22.75
Seaboard, N. J., f.o.b.	21.50
Philadelphia, f.o.b.	20.55
Swedeland, Pa., f.o.b.	20.50
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Louis, del'd	20.98
Birmingham, del'd	17.86

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick	*Carloads, Per* 1000
First quality, Pa., Md., Ky., Mo. except Salina, Pa., add $5)	$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00
Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$69.00
Magnesite Brick	
Standard, Balt. and Chester	$91.00
Chemically bonded, Balt. and Chester	80.00
Grain Magnesite	*Std. ⅜-in. grains*
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢	$12.25

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, except New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled (18 ga. up)	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$5.15-5.71	$6.31-6.57	$7.27-7.47	$5.35-5.66	$6.51	$5.37-5.50	$5.09-5.20	$5.35-5.50	$6.16-6.26	$9.14	$9.29	$10.54	$10.69
New York	5.40-5.98	6.28-6.43	7.25-7.73	5.58-5.88	6.48-6.73	5.78	5.32-5.58	5.53-5.63	6.18-6.38	9.17-9.53	9.32-9.68	10.40-10.77	10.55-10.92
Boston	5.48-5.64	6.39	7.56-7.69	5.54-5.89	6.75-6.79	5.74	5.39-5.54	5.48-5.59	6.24-6.34	9.40-9.44	9.55-9.59	10.84-10.94	10.92-11.09
Baltimore	5.28	6.18	7.15-7.38	5.34	....	5.53	5.33-5.39	5.39	6.13	....	....	....	....
Chicago	4.85-5.10	5.75-5.95	6.95-7.05	4.85-5.30	6.15	5.10	4.90	4.90	5.70	9.00	9.15	10.40	10.55
Milwaukee	5.02-5.07	5.92	7.12-7.22	5.02-5.37	6.32	5.22-5.27	5.07	5.07	5.87	9.15-9.17	9.32	10.52-10.57	10.67-10.72
Norfolk	5.75	....	....	....	....	6.00	6.00	6.00	....	....	....	....	....
Cleveland	4.98-5.20	5.75[1]-6.04[1]	7.18-7.24	5.02-5.65	6.70	5.35-5.54	5.16-5.42	5.15-5.34	5.70-5.95	9.14-9.29	9.29-9.79	10.54	10.69
Buffalo	4.85-5.10	5.75-5.85	7.55-7.70	5.55-5.56	6.35	5.45-5.46	5.10	5.15-5.20	5.90-6.05	9.05-9.35	9.40-9.50	10.75	20.90
Detroit	5.20-5.55	6.05-6.50	7.45	5.25-5.70	6.25-6.55	5.50-5.55	5.30-5.37	5.30-5.52	6.02-6.07	9.31-9.55	9.20-9.47	10.72-10.95	10.87-11.10
Cincinnati	5.14-5.36[8]	5.82-6.21[8]	6.97-7.45	5.25-5.62[8]	6.31	5.50-5.71[8]	5.30-5.47[8]	5.30-5.62[8]	6.06-6.17[8]	9.31-9.35	9.50-9.51	10.75-10.76	10.90-10.91
St. Louis	5.19	6.04-6.09	7.29-7.39	5.19-5.79	6.49	5.39-5.44	5.24	5.24	6.04	9.34	9.49	10.74	10.89
Pittsburgh	4.85-4.90	5.75[1]	6.95-7.05	5.00-5.35	5.95	5.05-5.25	4.90-5.15	4.90-5.10	5.65-5.80	9.00	9.15	10.40	10.55-10.80
St. Paul	5.41	6.31	7.30-7.61	5.41	....	5.66	5.48	5.48	6.26	9.56	9.71	10.96	11.11
Omaha	5.92	....	9.18	5.92	....	6.17	5.97	5.97	6.77	....	....	....	....
Birmingham	5.05[1]	6.36	6.45	5.05[11]	6.36	5.25[11]	5.00[11]	5.00[11]	6.51	....	....	....	....
Houston	6.40	....	8.80	6.75	....	6.35	6.20	6.40	7.60	9.80	9.65	10.75	10.95
Los Angeles	6.30-6.40	7.85[1]-7.90	7.95-8.55	6.60-6.66	9.35[8]	5.95-6.10	5.75-5.90	6.05	7.85[15]-7.95	10.35[15]	10.20[15]	11.75[15]	11.95[15]
San Francisco	5.95[8]	7.15[2]	8.05-8.55[2]	6.75[8]	8.25	6.30-7.68[8]	5.90-6.90	5.90	7.55	10.35[15]	10.20[15]	11.75[15]	11.95[15]
Portland	6.50[4]	8.00[2]	8.15[2] 8.45[2]	6.85[4]	....	6.30[4]	6.25[4]	6.25[4]	8.25[4]	....	10.45[15]	....	12.05[15]
Seattle	6.20[4]-6.30[4]	7.75[2]-7.85[2]	7.65 8.00	6.55[4]-6.65[4]	....	6.20-6.30	6.15-6.25	6.05[4]-6.15[4]	8.00[14]-8.10[14]	....	10.30[15]-10.40[15]	....	12.00[15]-12.05[15]
Salt Lake City	6.15-8.00	7.35	7.90-9.06	7.10-7.45	....	5.75-6.65	6.65-7.00	6.95-7.25	7.55-8.40	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	.....	.....	.....	.....
Birmingham	42.88	43.38	.....	.....	.....
Buffalo	44.00-48.00*	44.00-48.00*	44.50-48.50*	.....	.....
Chicago	46.00	46.00	46.50	47.00	.....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.00	46.50	47.00	.....
Erie	45.50	46.00	46.50	47.00	.....
Everett	.....	48.75	49.25	.....	.....
Granite City	47.90	48.40	48.90	.....	.....
Neville Island	46.00	46.50	46.50	.....	.....
Provo	46.00	46.50	.....	.....	.....
Sharpsville	43.00	43.50	43.50	44.00	.....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	43.00	.....	.....	.....	.....
Swedeland	50.00	50.50	51.00	51.50	.....
Toledo	45.50	46.00	46.50	47.00	.....
Troy, N. Y.	.....	.....	.....	.....	54.00
Youngstown	46.00	46.50	46.50	.....	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	48.75	49.25	.....	.....
Boston	Steelton	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn	Bethlehem	3.90	51.90	.....	.....	.....	.....
Cincinnati	Birmingham	6.09	48.97	49.47	.....	.....	.....
Jersey City	Bethlehem	2.39	50.39	.....	.....	.....	.....
Los Angeles	Provo	6.93	52.93	53.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	49.03-48.53	49.53-49.03	49.53	50.03	54.03
Philadelphia	Bethlehem	2.21	50.21	.....	.....	.....	.....
Philadelphia	Swedeland	1.31	51.31	51.81	52.31	52.81	.....
Philadelphia	Steelton	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco	Provo	6.93	52.93	53.43	.....	.....	.....
Seattle	Provo	6.93	52.93	53.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	.....	.....

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* Republic Steel Corp. price: Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$56.50; f.o.b. Buffalo—$57.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $66.00 per gross ton, f.o.b. Lyles, Tenn. Delivered Chicago, $73.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.

F.o.b. Birmingham	$162
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$160
F.o.b. Johnstown, Pa.	$162
F.o.b. Sheridan, Pa.	$160
F.o.b. Rockwood, Tenn.	$165
Fo.b. Etna, Pa.	$163

$2.00 for each 1% above 82% Mn; **penalty, $1.80 for each 1% below 78%.**

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.0
Ton lots	11.6
Less ton lots	12.5

Spiegeleisen

Contract prices, gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	**19-21% Mn 3% max. Si**
Palmerton, Pa..	$61.00	$62.00
Pgh. or Chicago	65.00	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	**32**
Ton lots	**34**
Less ton lots	**36**

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C, 7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5%, max. C.

Carload bulk	8.60
Ton lots	10.25
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	10.0
Ton lots	11.6
Less ton lots	12.5

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth $81.00, foundry, $82.00; $81.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.

Carload, bulk	5.90
Ton lots	7.50
Less ton lots	8.40

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, f.o.b. shipping point, freight allowed.

25% Si	17.50
50% Si	10.50
75% Si	13.00
85% Si	14.65
0-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	**Turnings**	**Distilled**
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.

0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35

Briquets — Contract price, cents per pound of briquet, delivered, 60% chromium.

Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carload	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si. 4-6% Mn, 1.25% max. C.

Carload	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb. chromium contained packed, delivered, ton lots. 97% min. Cr. 1% max. Fe.

0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots	19.75
Less ton lots	21.00

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max, St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.

Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 56%, Ti 9%, Ca 5%.

Ton lots and carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	**$2.90**
Crucible	**3.00**
High speed steel (Primos)	**3.10**
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound Contained V_2O_5	**$1.20**
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	$2.75
Less ton lots	$2.80
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	**95¢**
Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	**80¢**
Molybdenum oxide briquets, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	**80¢**
Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	**80¢**
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	**$1.23**
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	**$1.35**
Less ton lots	**1.40**
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	**$160.00**
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	**$65.00**
10 tons to less carload	**75.00**
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	**6.60¢**
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	**8.40¢**
Ton lots	**9.30¢**
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	**10.50**
Ton lots	**11.25**

Boron Agents

Contract prices per pound of alloy, delivered.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. X D.	
Ton lot	**$1.20**
Manganese—Boron 75.00% Mn. 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. X D, delivered.	
Ton lots	**$1.67**
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	**$1.80**
Silcaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	**93¢**
No. 6	**63¢**
No. 79	**45¢**
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	**45¢**
Less ton lots, per pound	**50¢**
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	**8.625¢**
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	**$6.25**

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(CONTINUED FROM PAGE 125)

• **G. A. Watson** has been appointed manager of sales for the Chicago Div., Electro Metallurgical Sales Corp., succeeding **J. H. Spillane,** who has been transferred to the general sales office in New York. Mr. Watson previously served in various sales and service capacities in both Chicago and Detroit offices of the company, which is a unit of Union Carbide & Carbon Corp.

• **John W. Colgan,** sales manager, Handy & Harman, New York, has been elected a director of the company.

• **George W. Perry** has been appointed advertising manager of the Cook Electric Co., Chicago. Mr. Perry was formerly associated with Kellogg Switchboard & Supply Co.

• **W. B. Landers** of Houston has been appointed district sales representative in southeast Texas for the Baker Industrial Truck Div., of Baker-Raulang Co., Cleveland. **Fred R. Ramsen** of St. Louis has been appointed Baker-Raulang district sales representative in southern Illinois and eastern Missouri.

• **Edward W. Lang** and **W. H. Abernethy,** formerly with the Southern Research Institute, Birmingham, have become associated with the Sloss-Sheffield Steel & Iron Co., Birmingham. Mr. Lang has joined the research department and Mr. Abernethy is in charge of operations at the company's North Birmingham paint plant.

• **A. J. Robertson** has been appointed a sales representative in Alabama for the Southern States Iron Roofing Co., Savannah.

• **Crosby M. Kelly** has been named director of advertising and sales promotion of the Rapids-Standard Co. Inc., Grand Rapids.

• **Winston H. Jones** has been appointed director of sales for Conlon-Moore Corp., Cicero, Ill. **James C. Witty** has joined the company as engineer in the ironer department.

• **Edmund J. Hogan** has been appointed general sales manager of the West Coast Div., Willys-Overland Motors, Maywood, Calif.

• **Robert A. Wallace** has become chief engineer, McDowell Mfg. Co., Pittsburgh. He formerly headed Robert A. Wallace Co. and has previously been associated with General Electric Co., Armstrong Cork Co. and Carnegie-Illinois Steel Corp.

• **William F. Coleman** has been elected vice-president of sales for Amgears, Inc., Chicago. Mr. Coleman comes to Amgears after more than 25 years of executive experience in the gear industry, including several years as president of another gear company.

• **Julius Goldstein,** formerly associated with the Irvin Metals Co., has taken charge of the nonferrous operations for the David J. Joseph Co., Cincinnati. **Irvin M. Bettman,** formerly associated with the First National Bank of Cincinnati, has accepted a position with the Joseph Co. in charge of finance.

• **Everett G. McGill** has been made manager of the organization and analysis department of Packard Motor Car Co., Detroit. Mr. McGill has previously held marketing research posts with Ford Motor Co. and the U. S. Dept. of Commerce.

• **Carl F. Schultz** has been named engineering assistant to the general manager of Lincoln-Mercury Div. of Ford Motor Co. Mr. Schultz was formerly with Oldsmobile. **M. L. Wiesmyer** has been appointed general manager in charge of all plant assembly operations of Ford's Rouge Plant. Previously Mr. Wiesmyer headed all Ford branch plant assembly operations with the exception of the Rouge and Highland Park plants.

• **George Innes** has been appointed works manager, Barnett Foundry & Machine Co., Irvington N. J. Mr. Innes joined the company in 1945 and has previously been associated with Worthington Pump & Machinery Corp.

• **Walter A. Fairchild** has been appointed special representative of the Bridgeport Steel Co., Bridgeport, Conn. Mr. Fairchild has been associated with Bliss & Laughlin Inc. for the past 12 years.